BWSSB OWC-Jaladhare Application

Annexure-1

1. Introduction

BWSSB (Bangalore Water Supply and Sewage Board) has developed an online web application called Jaladhare with the primary objective of extending water connections to areas within the BBMP (Bruhat Bengaluru Mahanagara Palike) limits in Bangalore. Launched in 2015, this platform was built using PHP, CodeIgniter, and MySQL, aiming to streamline the process of obtaining new water connections for consumers. By digitizing the application and approval workflow, Jaladhare has made it more convenient for residents to access essential water services.

Consumers wishing to obtain a water connection can easily register and log in to the Jaladhare application. They fill out an online application form, which is then forwarded to the concerned approving authority. The authority conducts a field inspection to verify the details provided. Upon approval of the application, an RR (Revenue Register) number is generated, and a plumber assigned to initiate the connection process. This end-to-end digital workflow enhances transparency and efficiency, reducing the time and effort required from both the consumers and the administrative staff.

Despite its initial success, the Jaladhare application now faces challenges due to its outdated technology stack. Updating the platform will ensure that Jaladhare continues to effectively serve Bangalore's residents by providing a seamless and secure way to access water connection services.

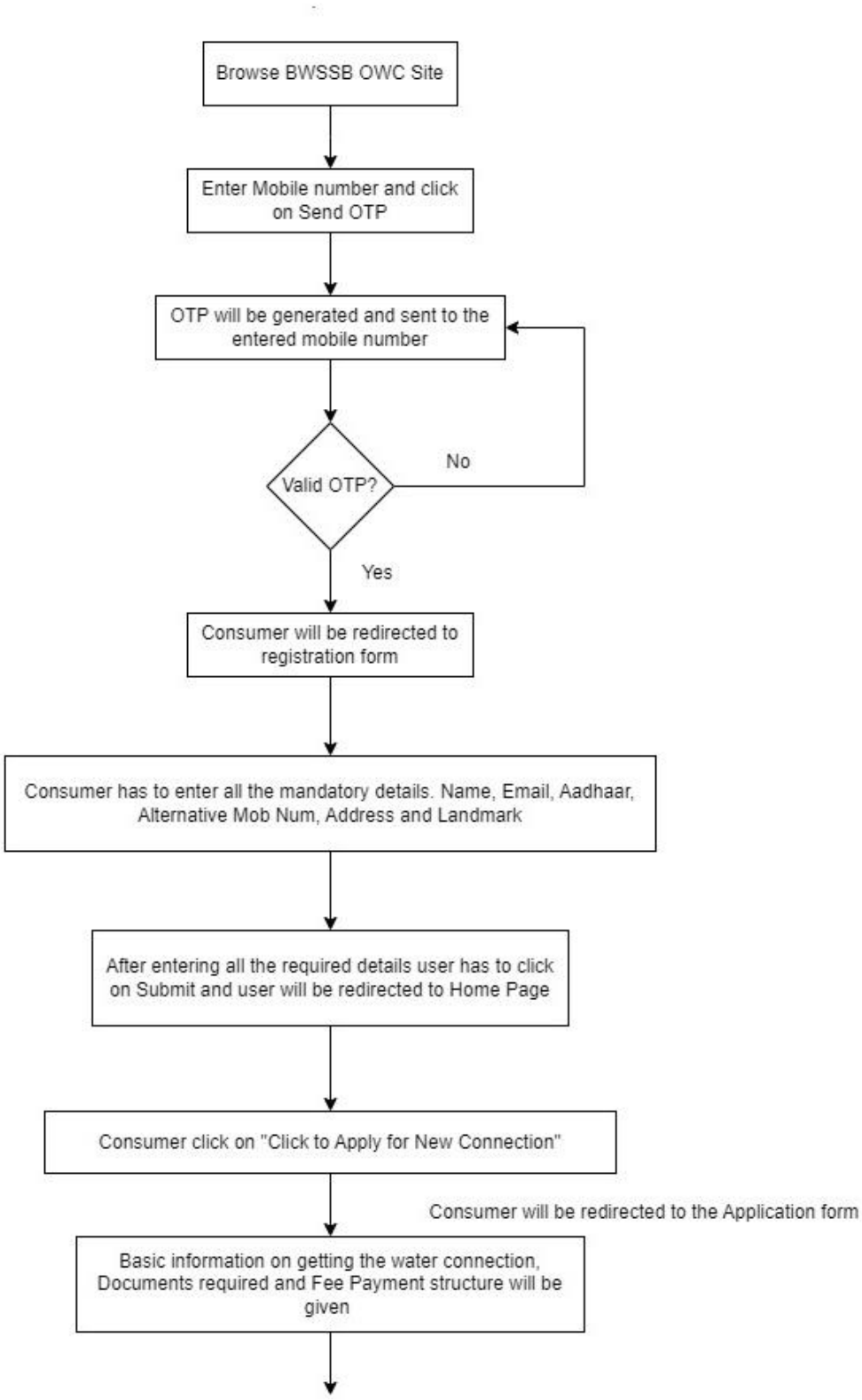
2. Objective

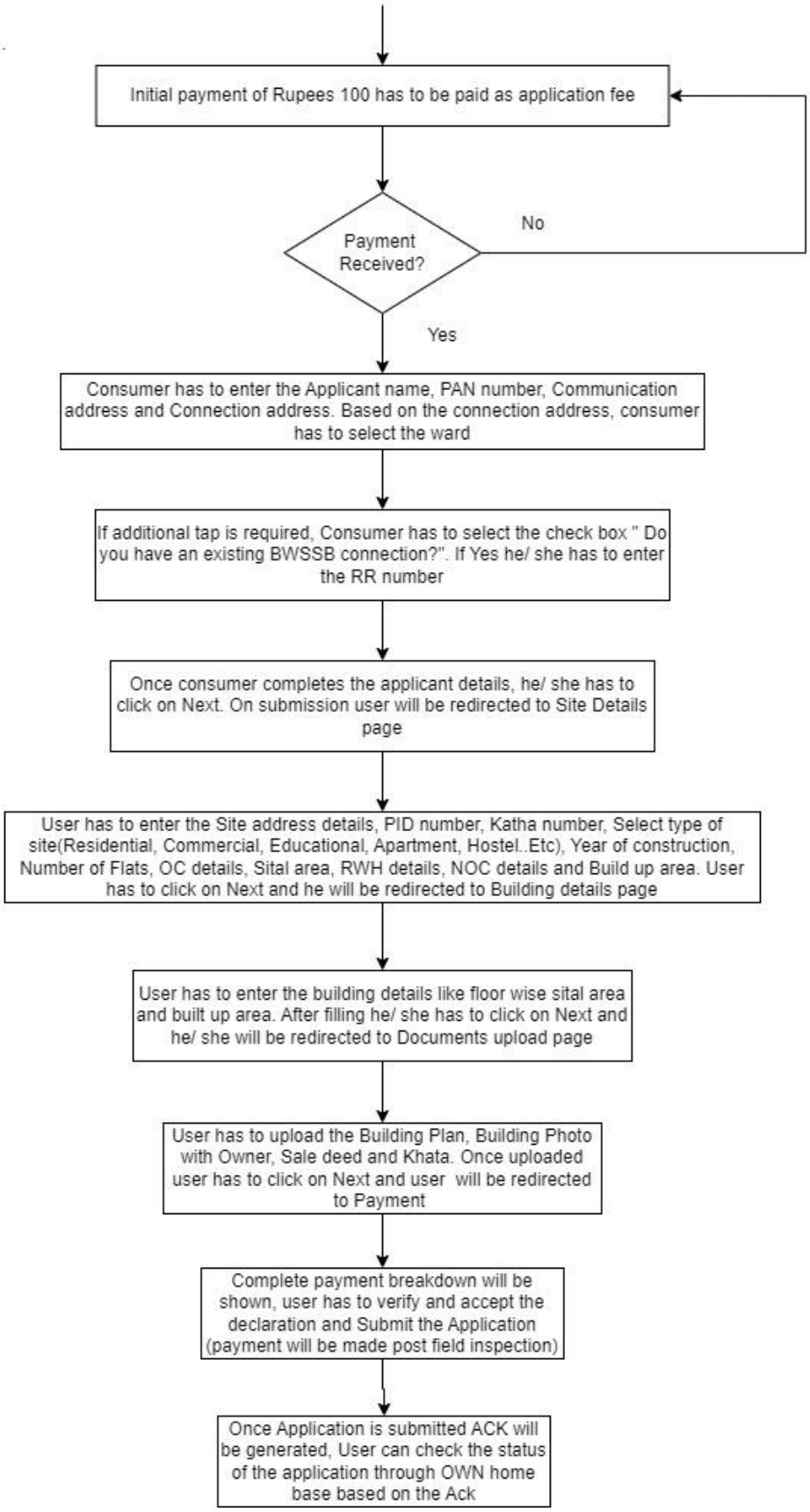
The primary objectives of the Jaladhare application are

a. Provide a digital platform for consumers within the BBMP (Bruhat Bengaluru Mahanagara Palike) limits to easily apply for new water connections without needing to visit offices physically.
b. Allow authorities to efficiently manage and track water connection applications, ensuring that requests are processed quickly and systematically through field inspections, approvals, and further actions.
c. Enable a structured process for the review and approval of water connection requests, ensuring timely approvals or rejections and reducing the risk of manual errors.
d. Integrate with Sajala to automate the assignment of RR (Revenue Register). Also integrate with Sakala, EODB and other departments software.
e. Ensure transparency by providing applicants with the ability to track the status of their applications in real time, including inspection and approval status.
f. Store and manage application data (such as RR numbers and consumer details) securely in a database (MySQL), allowing for future reference, audits, and service management.
g. Ensure that all applications, approvals, rejections, and assignments are properly recorded and can be audited for compliance, transparency, and accountability.
h. Provide extensive reports to enable visualization and decision making by the administrative staffs

3. Existing Application Flow

3.1. Consumer Flow


Browse BWSSB OWC Site
Enter Mobile number and click on Send OTP
OTP will be generated and sent to the entered mobile number
Valid OTP?
No
Yes
Consumer will be redirected to registration form
Consumer has to enter all the mandatory details. Name, Email, Aadhaar, Alternative Mob Num, Address and Landmark
After entering all the required details user has to click on Submit and user will be redirected to Home Page
Consumer click on "Click to Apply for New Connection"
Consumer will be redirected to the Application form
Basic information on getting the water connection, Documents required and Fee Payment structure will be given


Initial payment of Rupees 100 has to be paid as application fee
Payment Received?
No
Yes
Consumer has to enter the Applicant name, PAN number, Communication address and Connection address. Based on the connection address, consumer has to select the ward
If additional tap is required, Consumer has to select the check box " Do you have an existing BWSSB connection?". If Yes he/ she has to enter the RR number
Once consumer completes the applicant details, he/ she has to click on Next. On submission user will be redirected to Site Details page
User has to enter the Site address details, PID number, Katha number, Select type of site(Residential, Commercial, Educational, Apartment, Hostel..Etc), Year of construction, Number of Flats, OC details, Sital area, RWH details, NOC details and Build up area. User has to click on Next and he will be redirected to Building details page
User has to enter the building details like floor wise sital area and built up area. After filling he/ she has to click on Next and he/ she will be redirected to Documents upload page
User has to upload the Building Plan, Building Photo with Owner, Sale deed and Khata. Once uploaded user has to click on Next and user will be redirected to Payment
Complete payment breakdown will be shown, user has to verify and accept the declaration and Submit the Application (payment will be made post field inspection)
Once Application is submitted ACK will be generated, User can check the status of the application through OWN home base based on the Ack

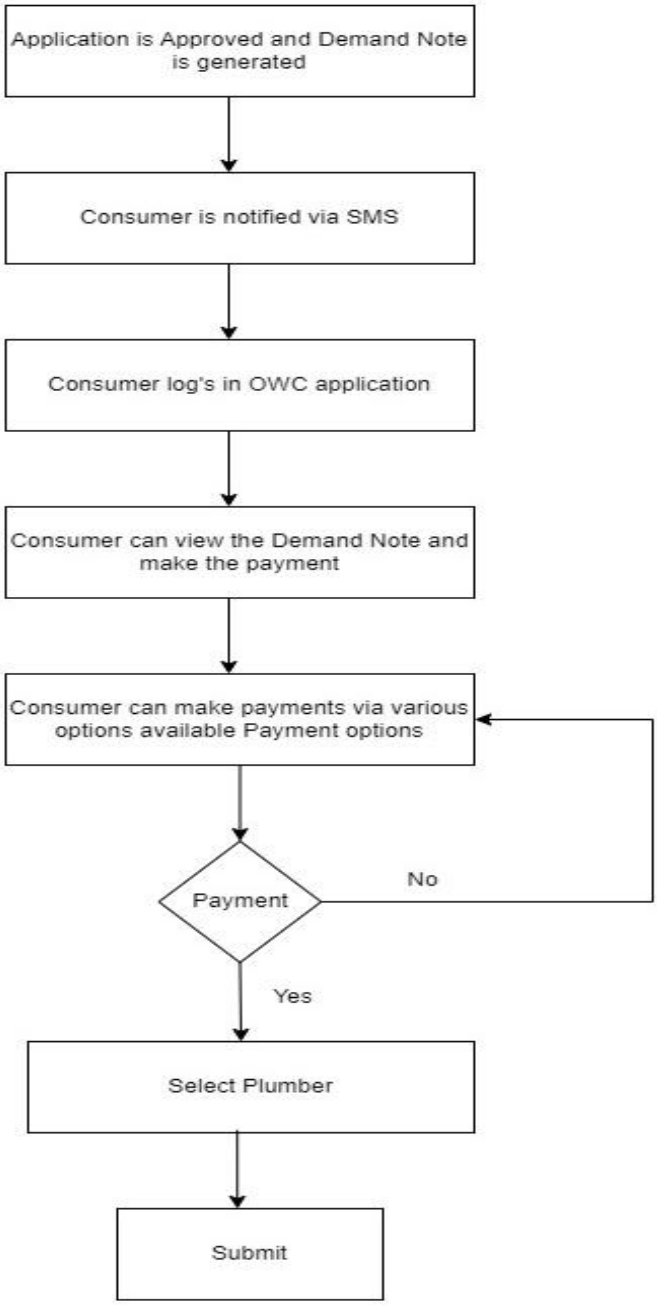
1. The user will be directed to the landing page via the link
2. On the landing page, the consumer must enter a valid mobile number and click the "Send OTP" button.

3. Upon receiving the valid OTP, the consumer needs to enter it to successfully to access the Registration page.
4. Consumer has to register first by entering the fields like Name, Email, Aadhaar, Address, Pincode and Alternate Mobile Number. After entering all the mandatory details consumer has to click on Submit and He/ she will be redirected to Home page.
5. From the Home page, by clicking the “Click here to apply for new connection” button, the consumer can start a new application. This will lead to the dashboard page, which contains various sections such as Basic Details, Site Details, Building Details, Documents, and Payments.
6. Consumer has to initially pay a payment of rupees 100 as an application registration fee by various payment method available. Once the payment is successful consumer will be redirected to application form.
7. In the first section, Basic Details, the consumer needs to fill out information such as Applicant Name, PAN Number, Communication Address, Connection Address, an optional Additional Tap checkbox, and a dropdown to select the Ward Name.

a. The options available under the ward name drop-down is based on the details entered under the field Connection address.
b. If the additional tap check is selected/checked, the consumer has to mandatorily enter the RR number.

8. After filling out the Basic Details, the consumer can proceed to the Site Details section by clicking the Next button.
9. In the Site Details section, the consumer must provide details such as PID Number, Katha Number, Site Type, Year of Construction, Number of Flats, OC Details, Sital Area, RWH Details, NOC Details, and Built-up Area.
    a. The Site Type dropdown includes options like Residential, Commercial, Apartment, and Hotel/Restaurant/Hostel.
    b. If the consumer selects "Yes" for OC Details, RWH Details, or NOC Details, they must provide the relevant information and upload the corresponding document proof.
10. Once the Site Details are complete, the consumer can move to the Building Details section by clicking the Next button.
11. In the Building Details section, the consumer must input floor-wise details of the sital and built-up areas in square feet and square meters.
12. After completing the Building Details, the consumer can proceed to the Documents section by clicking the Next button.
13. In the Documents section, the consumer needs to upload files such as the Building Plan, a Building Photo with the owner, the Sale Deed, and the Khata.
14. Once all documents are uploaded, the consumer can navigate to the Payments section.
15. In the Payments section the consumer will be shown with all the applicable charges along with a final amount that would be payable on his/her end once the site inspection is done.
16. Finally, after reviewing all the details, the consumer can submit the application by clicking the Confirm button present at the bottom right corner of the Payments page.

3.2. Consumer Flow Post Approval


Application is Approved and Demand Note is generated
Consumer is notified via SMS
Consumer log's in OWC application
Consumer can view the Demand Note and make the payment
Consumer can make payments via various options available Payment options
Payment
No
Yes
Select Plumber
Submit

1. Once the Competent Authority is satisfied with the inspection report shared by the concerned AE/JE, he/she approves the application and a Demand Note is generated.
2. The consumer is notified of the Demand Note generation through an SMS.
3. The consumer can then log in to view the generated Demand Note and make the payment for the final amount stated.
4. The consumer has several payment options available to choose from.
5. After selecting a payment method, the consumer proceeds with the payment.
6. If the payment is successful, the consumer is given the option to select a plumber of their choice.
7. After selecting the plumber, the consumer submits their choice by clicking the Submit button.

3.3. Admin Prorata Segregation

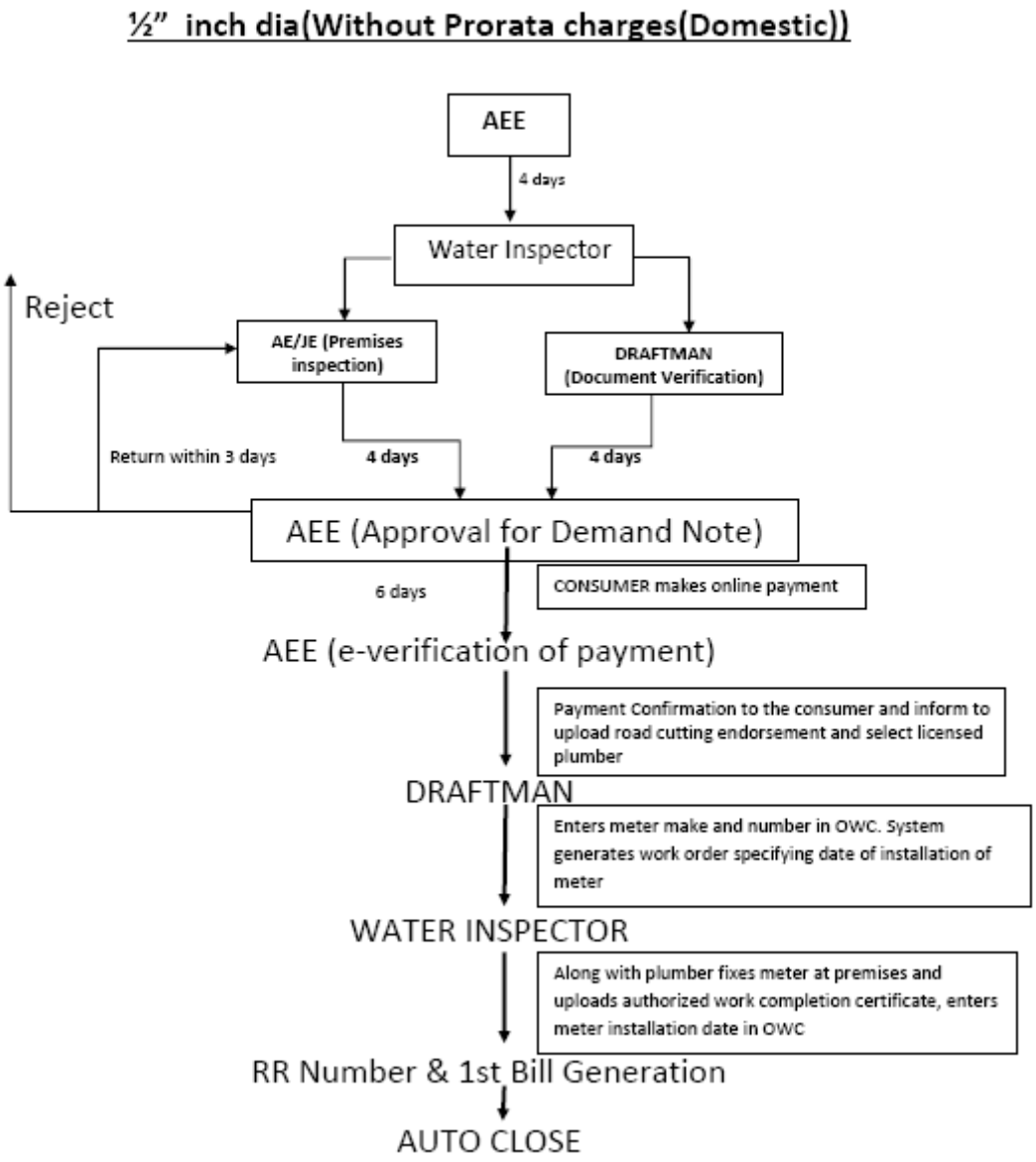
Existing Delegation of powers as per BWSSB in accordance with which approval get triggered (NBote: The delegation powers may be modified as per the Boards decision, the application has to be changed/upgraded accordingly)

Sl.No	Authorised Person	Size of water supply connection	Domestic connections	Non-domestic connections	Description
1	AEE's	1/2 " dia (15 mm dia)	Upto 700 smt. Built up area	Upto 500 smt.Built up area	Domestic & Non Domestic both combined upto 700 smtbuiltup area **(If the commercial built up area in the combined utility exceeds 500 smt, it should be forwarded to next higher officer)**
2	EE's	3/4" dia (20 mm dia)	701 smt. Built up area upto 2,000 smt. Built up area	501 smt. Built up area upto 1,000 smt. Built up area	Domestic & Non Domestic both combined from 701 smt.upto 2,000 smt builtup area **(If the commercial built up area in the combined utility exceeds 1000 smt, it should be forwarded to next higher officer)**
3	ACE(M)-I, ACE(M)-II ACE(M)-III ACE(M)-IV	1" dia (25 mm dia)	2,001 smt. Built up area upto 5,000 smt. Built up area	1,001 smt. Built up area upto 3,000 smt. Built up area	Domestic & Non Domestic both combined from 2,001 smtupto 10,000 smt builtup area
4	CE(M)	1 1/2" dia (40 mm dia)	5,001 Smt. built up area upto 20,000 Smt. Built up area	3,001 Smt. built up area upto 20,000 Smt. Built up area	Domestic & Non Domestic both combined from 10,001 smtupto 20,000 smt builtup area
5	EIC	2" dia (50 mm dia)	20,001 Smt. built up area upto 30,000 smt. Built up area	20,001 Smt. built up area upto 30,000 smt. Built up area	Domestic & Non Domestic both combined from 20,001 smtupto 30,000 smt builtup area

6	EIC	3" dia (80 mm dia)	30,001 Smt. Built up area upto 50,000 smt. Built up area	30,001 Smt. Built up area upto 35,000 smt. Built up area	Domestic & Non Domestic both combined from 30,001 smtupto 50,000 smt builtup area
7	Chairman	4" dia (100 mm dia) & above	50,001 smt. built up area and above	35,001.00 smt. Built up area and above	Domestic & Non Domestic both combined from 50,001 smt.builtup area

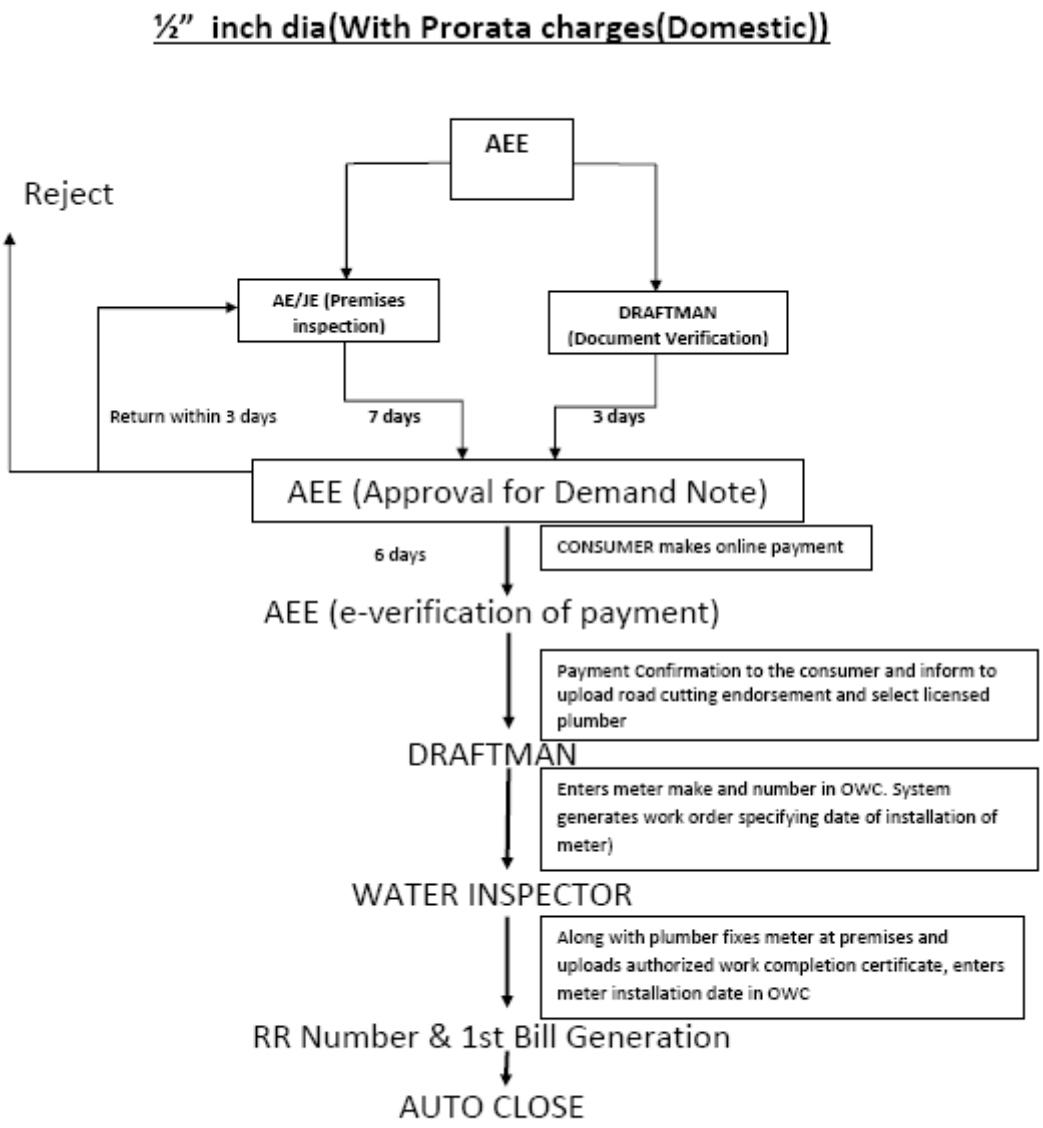
3.4. Admin Flow

3.4.1. ½ Inch Dia (Without Prorata Charges (Domestic))


½" inch dia(Without Prorata charges(Domestic))
AEE
4 days
Water Inspector
Reject
AE/JE (Premises inspection)
DRAFTMAN (Document Verification)
Return within 3 days
4 days
4 days
AEE (Approval for Demand Note)
6 days
CONSUMER makes online payment
AEE (e-verification of payment)
Payment Confirmation to the consumer and inform to upload road cutting endorsement and select licensed plumber
DRAFTMAN
Enters meter make and number in OWC. System generates work order specifying date of installation of meter
WATER INSPECTOR
Along with plumber fixes meter at premises and uploads authorized work completion certificate, enters meter installation date in OWC
RR Number & 1st Bill Generation
AUTO CLOSE

1. Once the application is accessible under the AEE's login, they will assign it to the concerned Water Inspector for further processing. (Note: this has to happen immediately upon receipt of the application)
2. The Water Inspector has to process the application within 4 days & then forward the application to the concerned AE/JE for premises inspection.
3. Within 4 days from the date of receiving, the concerned AE/JE must complete their tasks, prepare the inspection report, and forward it to the AEE for review.
4. If the AEE is not satisfied with the reports, he/she will return them (within 3 days) to the concerned AE/JE for re-evaluation and submission of an updated report, or reject the application if the details are found to be incorrect based on the reports.
5. If the AEE is satisfied with the reports, within 6 days from then, he/she will generate the Demand Note and share it with the consumer for payment.
6. Once the payment by the consumer is successful the AEE verifies the E-receipt, forwards it to the Draftsman and share the same with the consumer informing them to upload the road cutting endorsement and select a licensed plumber.
7. The Draftsman then enters the meter make and number in the OWC system, which generates a work order specifying the date of installation for the meter. The Draftsman then forwards the same to the Water Inspector.
8. The Water Inspector, along with the Plumber, installs the meter at the premises, uploads the authorized Work Completion Certificate, and records the meter installation date in the OWC system.
9. After this, the RR number following the first bill is generated in the Sajala Billing Software.

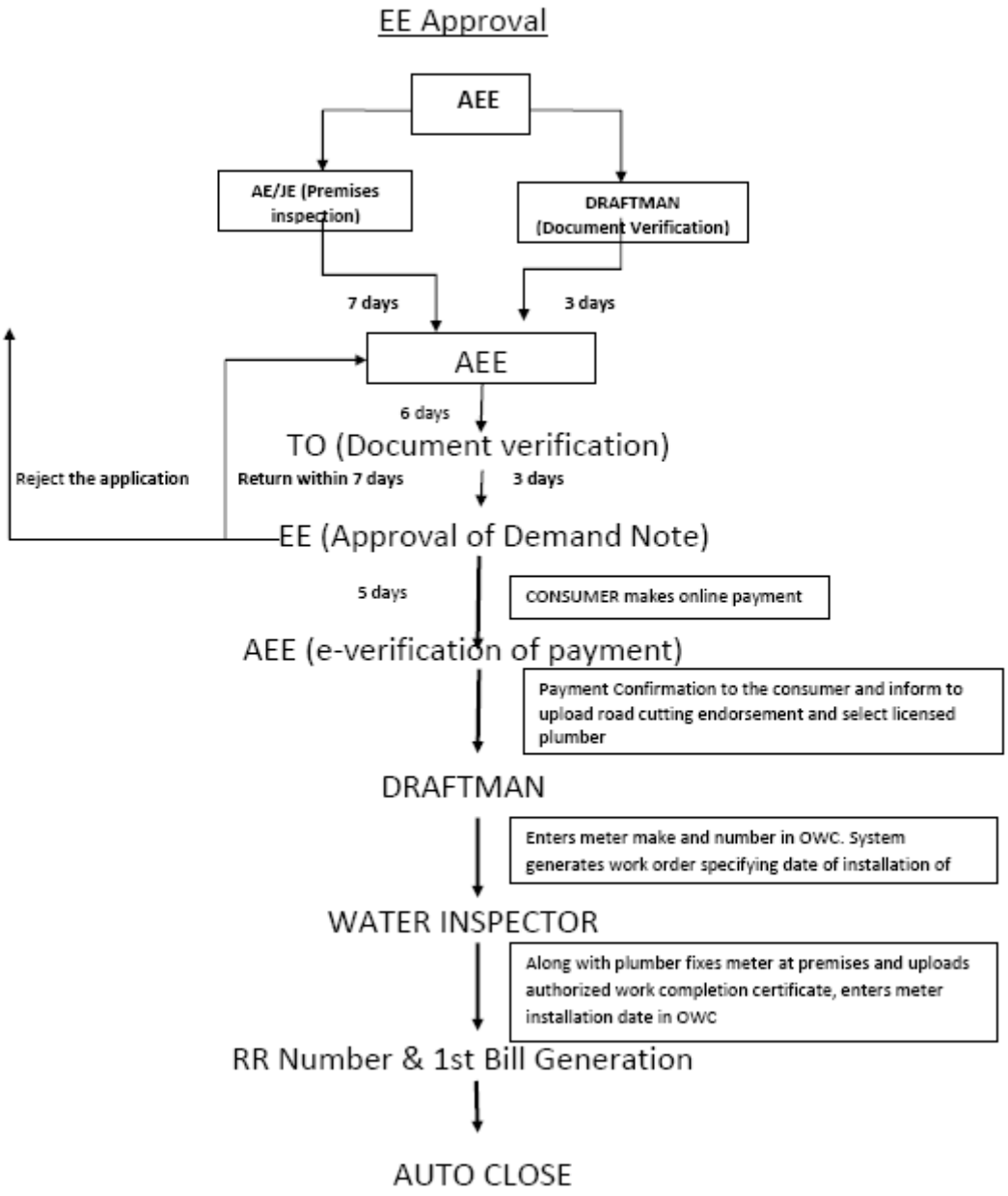
3.4.2. ½Inch Dia (With Prorata Charges (Domestic))


½" inch dia(With Prorata charges(Domestic))
AEE
Reject
AE/JE (Premises inspection)
DRAFTMAN (Document Verification)
Return within 3 days
7 days
3 days
AEE (Approval for Demand Note)
6 days
CONSUMER makes online payment
AEE (e-verification of payment)
Payment Confirmation to the consumer and inform to upload road cutting endorsement and select licensed plumber
DRAFTMAN
Enters meter make and number in OWC. System generates work order specifying date of installation of meter)
WATER INSPECTOR
Along with plumber fixes meter at premises and uploads authorized work completion certificate, enters meter installation date in OWC
RR Number & 1st Bill Generation
AUTO CLOSE

1. Once the application is accessible under the AEE's login, they will assign the application to the concerned AE/JE for premises inspection. (Note: this has to happen immediately upon receipt of the application)
2. The concerned AE/JE (within 7 days) must complete their tasks within the stipulated time, prepare the inspection report, and forward it to the AEE for review.
3. If the AEE is not satisfied with the reports, he/she will return them (within 3 days) to the concerned AE/JE for re-evaluation and submission of an updated report, or reject the application if the details are found to be incorrect based on the reports.
4. If the AEE is satisfied with the reports, within 6 days from then, he/she will generate the Demand Note and share it with the consumer for payment.
5. Once the payment by the consumer is successful the AEE verifies the E-receipt, forwards it to the Draftsman and shares the same with the consumer informing them to upload the road cutting endorsement and select a licensed plumber.

6. The Draftsman then enters the meter make and number in the OWC system, which generates a work order specifying the date of installation for the meter. The Draftsman then forwards the same to the Water Inspector.
7. The Water Inspector, along with the Plumber, installs the meter at the premises, uploads the authorized Work Completion Certificate, and records the meter installation date in the OWC system.
8. After this, the RR number following the first bill are generated in the Sajala Billing Software.

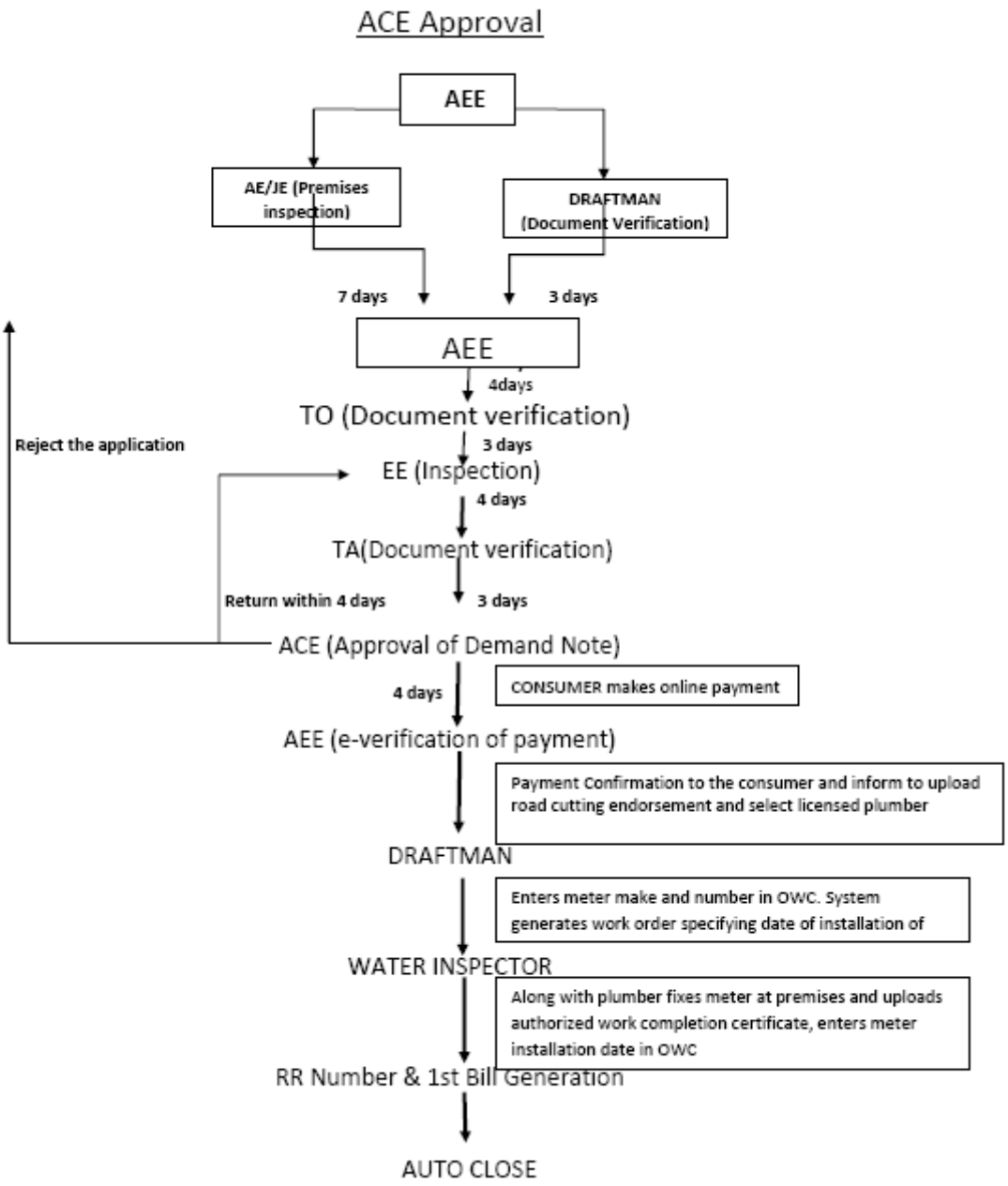
3.4.3. EE Approval


EE Approval
AEE
AE/JE (Premises inspection)
DRAFTMAN (Document Verification)
7 days
3 days
AEE
6 days
TO (Document verification)
Reject the application
Return within 7 days
3 days
EE (Approval of Demand Note)
5 days
CONSUMER makes online payment
AEE (e-verification of payment)
Payment Confirmation to the consumer and inform to upload road cutting endorsement and select licensed plumber
DRAFTMAN
Enters meter make and number in OWC. System generates work order specifying date of installation of
WATER INSPECTOR
Along with plumber fixes meter at premises and uploads authorized work completion certificate, enters meter installation date in OWC
RR Number & 1st Bill Generation
AUTO CLOSE

1. Once the application is accessible under the AEE's login, they will assign the application to the concerned AE/JE for premises inspection.

2. The concerned AE/JE (within 7 days) must complete their tasks within the stipulated time, prepare the inspection report, and forward it to the AEE for review.
3. The AEE then forwards the same to the TO for Document Verification. (Note: This has to be done within 6 days)
4. If the TO is satisfied, he/she will forward the application to the EE for review. (Note: This has to be done within 3 days)
5. If the EE is not satisfied then he/she will send back the application to the AEE, or reject the application if the details are found to be incorrect based on the reports. (Note: This has to be done within 7 days)
6. If the EE is satisfied then he/she will generate the Demand Note and share it with the consumer for payment. (Note: This has to be done within 6 days)
7. Once the payment by the consumer is successful the AEE verifies the E-receipt, forwards it to the Draftsman and shares the same with the consumer informing them to upload the road cutting endorsement and select a licensed plumber.
8. The Draftsman then enters the meter make and number in the OWC system, which generates a work order specifying the date of installation for the meter. The Draftsman then forwards the same to the Water Inspector.
9. The Water Inspector, along with the Plumber, installs the meter at the premises, uploads the authorized Work Completion Certificate, and records the meter installation date in the OWC system.
10. After this, the RR number following the first bill are generated in the Sajala Billing Software.

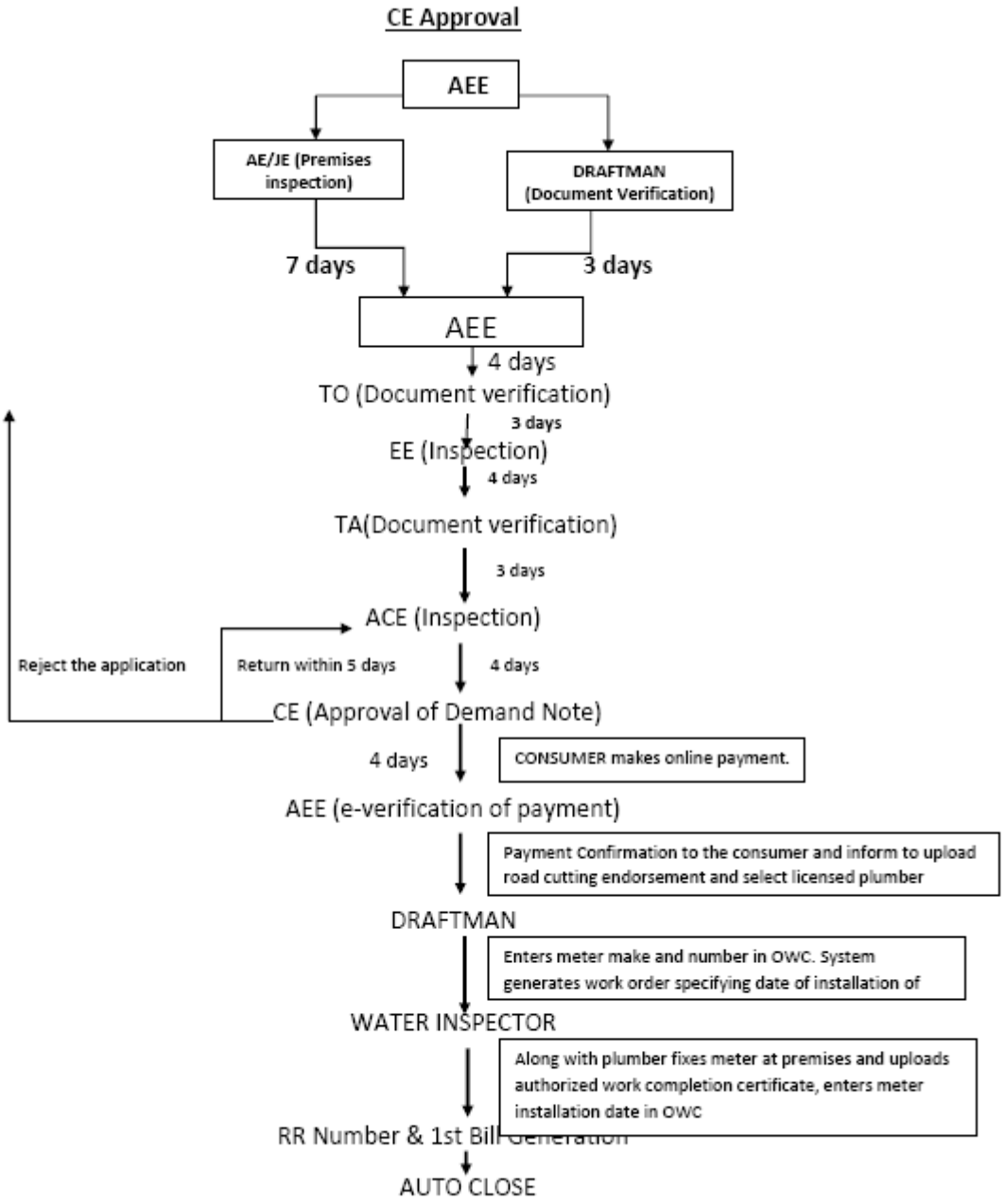
3.4.4. ACE Approval


ACE Approval
AEE
AE/JE (Premises inspection)
DRAFTMAN (Document Verification)
7 days
3 days
AEE
4days
TO (Document verification)
Reject the application
3 days
EE (Inspection)
4 days
TA(Document verification)
Return within 4 days
3 days
ACE (Approval of Demand Note)
4 days
CONSUMER makes online payment
AEE (e-verification of payment)
Payment Confirmation to the consumer and inform to upload road cutting endorsement and select licensed plumber
DRAFTMAN
Enters meter make and number in OWC. System generates work order specifying date of installation of
WATER INSPECTOR
Along with plumber fixes meter at premises and uploads authorized work completion certificate, enters meter installation date in OWC
RR Number & 1st Bill Generation
AUTO CLOSE

1. Once the application is accessible under the AEE's login, they will assign the application to the concerned AE/JE for premises inspection.
2. The concerned AE/JE (within 7 days) must complete their tasks within the stipulated time, prepare the inspection report, and forward it to the AEE for review.
3. The AEE then forwards the same for Document Verification. (Note: To be done within 4 days)
4. If the TO is satisfied, they will forward the application to the EE for inspection. (Note: To be done within 3 days)

5. Once done with the inspection the EE will forward the application to the TA for Document Verification at his/her level. (Note: To be done within 4 days)
6. The TA carries out the Document verification and further forwards the same to the ACE for approval. (Note: To be done within 3 days)
7. If the ACE is not satisfied then he/she will return the same (within 4 days) to the concerned EE for re-evaluation and submission of an updated report, or reject the application if the details are found to be incorrect based on the reports.
8. If the ACE is satisfied then he/she will generate the Demand Note and share it with the consumer for payment. (Note: To be done within 4 days).
9. Once the payment by the consumer is successful the AEE verifies the E-receipt, forwards it to the Draftsman and shares the same with the consumer informing them to upload the road cutting endorsement and select a licensed plumber.
10. The Draftsman then enters the meter make and number in the OWC system, which generates a work order specifying the date of installation for the meter. The Draftsman then forwards the same to the Water Inspector.
11. The Water Inspector, along with the Plumber, installs the meter at the premises, uploads the authorized Work Completion Certificate, and records the meter installation date in the OWC system.
12. After this, the RR number following the first bill are generated in the Sajala Billing Software.

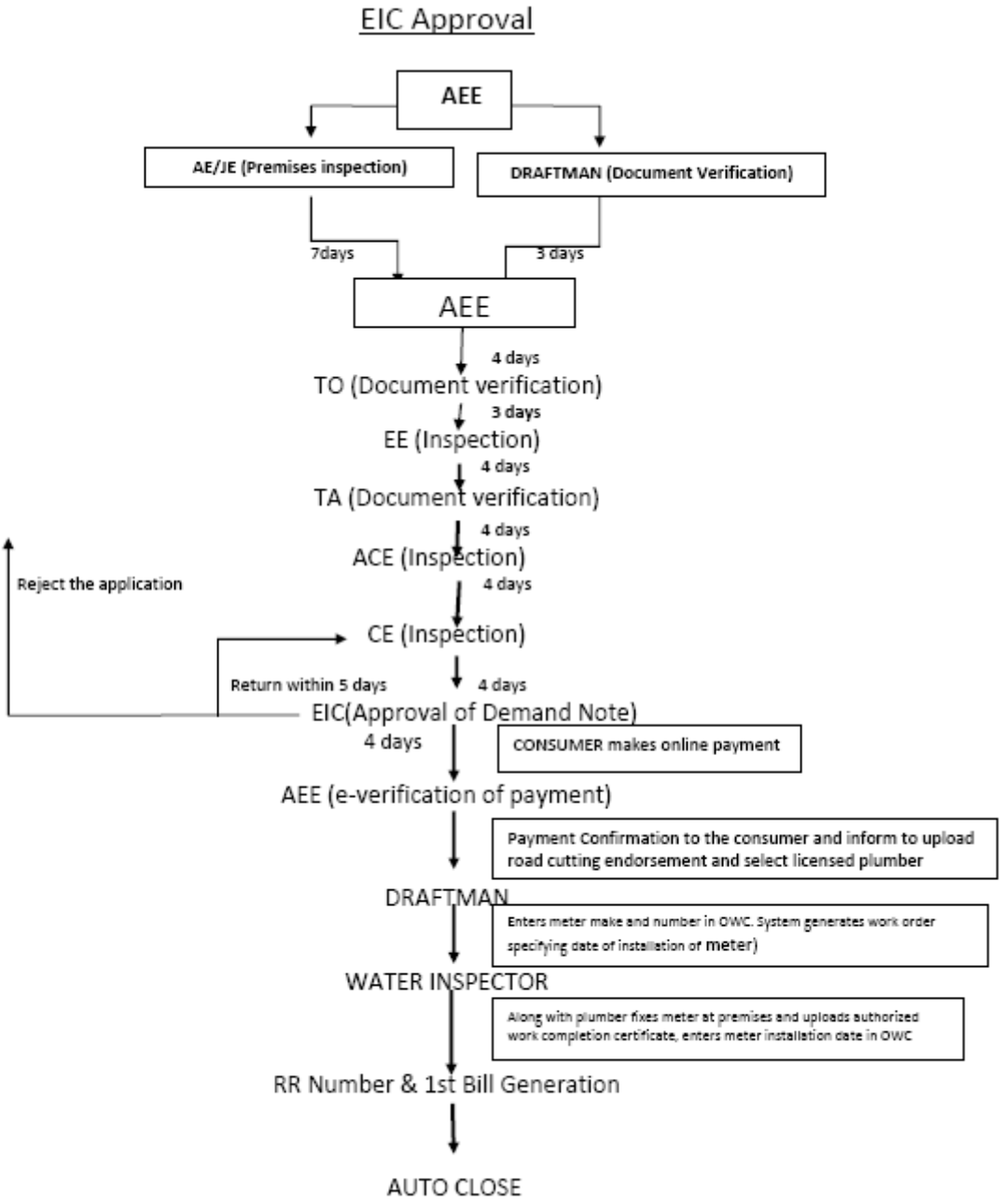
3.4.5. CE Approval


CE Approval
AEE
AE/JE (Premises inspection)
DRAFTMAN (Document Verification)
7 days
3 days
AEE
4 days
TO (Document verification)
3 days
EE (Inspection)
4 days
TA(Document verification)
3 days
ACE (Inspection)
Reject the application
Return within 5 days
4 days
CE (Approval of Demand Note)
4 days
CONSUMER makes online payment.
AEE (e-verification of payment)
Payment Confirmation to the consumer and inform to upload road cutting endorsement and select licensed plumber
DRAFTMAN
Enters meter make and number in OWC. System generates work order specifying date of installation of
WATER INSPECTOR
Along with plumber fixes meter at premises and uploads authorized work completion certificate, enters meter installation date in OWC
RR Number & 1st Bill Generation
AUTO CLOSE

1. Once the application is accessible under the AEE's login, they the concerned AE/JE for premises inspection.
2. The concerned AE/JE (within 7 days) must complete their tasks within the stipulated time, prepare the inspection report, and forward it to the AEE for review.
3. The AEE then forwards the same to TO for Document Verification. (Note: To be done within 4 days)
4. If the TO is satisfied, they will forward the application to the EE for inspection. (Note: To be done within 3 days)

5. Once done with the inspection the EE will forward the application to the TA for Document Verification at his/her level. (Note: To be done within 4 days)
6. The TA carries out the Document verification and further forwards the same to the ACE for Inspection. (Note: To be done within 3 days)
7. Once done with the inspection the ACE will forward the application to the CE for approval and generation of demand note. (Note: To be done within 4 days).
8. If the CE is not satisfied then he/she will return the same (within 5 days) to the concerned ACE for re-evaluation and submission of an updated report, or reject the application if the details are found to be incorrect based on the reports.
9. The CE if satisfied will approve the application and further generate a demand note and share it with the consumer for payment.
10. Once the payment by the consumer is successful the AEE verifies the E-receipt, forwards it to the Draftsman and shares the same with the consumer informing them to upload the road cutting endorsement and select a licensed plumber.
11. The Draftsman then enters the meter make and number in the OWC system, which generates a work order specifying the date of installation for the meter. The Draftsman then forwards the same to the Water Inspector.
12. The Water Inspector, along with the Plumber, installs the meter at the premises, uploads the authorized Work Completion Certificate, and records the meter installation date in the OWC system.
13. After this, the RR number following the first bill are generated in the Sajala Billing Software.

3.4.6. EIC Approval



1. Once the application is accessible under the AEE's login, they will assign the application to the concerned AE/JE for premises inspection and document verification. (Note: this has to happen within 4 days from the date of receiving the application)
2. The concerned AE/JE (within 7 days) must complete their tasks within the stipulated time, prepare the inspection report, and forward it to the AEE for review.
3. The AEE then forwards the same to TO for Document Verification. (Note: To be done within 4 days)
4. If the TO is satisfied, they will forward the application to the EE for inspection. (Note: To be done within 3 days)
5. Once done with the inspection the EE will forward the application to the TA for Document Verification at his/her level. (Note: To be done within 4 days)

6. The TA carries out the Document verification and further forwards the same to the ACE for Inspection. (Note: To be done within 3 days)
7. Once done with the inspection the ACE will forward the application to CE for inspection. (Note: To be done within 4 days).
8. Similarly the CE after completing the inspection at his/her level will forward the same to the EIC for approval. (Note: To be done within 4 days)
9. If the EIC is not satisfied then he/she will return the same (within 5 days) to the concerned CE for re-evaluation and submission of an updated report, or reject the application if the details are found to be incorrect based on the reports.
10. The EIC if satisfied will approve the application and generate a demand note and share the same with the consumer for online payment.(to be done within 4 days)
11. Once the payment by the consumer is successful the AEE verifies the E-receipt, forwards it to the Draftsman and shares the same with the consumer informing them to upload the road cutting endorsement and select a licensed plumber.
12. The Draftsman then enters the meter make and number in the OWC system, which generates a work order specifying the date of installation for the meter. The Draftsman then forwards the same to the Water Inspector.
13. The Water Inspector, along with the Plumber, installs the meter at the premises, uploads the authorized Work Completion Certificate, and records the meter installation date in the OWC system.
14. After this, the RR number following the first bill are generated in the Sajala Billing Software.

3.4.7. Chairman Approval

AEE
AE/JE (Premises inspection)
7 days
AEE
4 days
TO (Document Verification)
3 days
EE (Inspection)
4 days
TA (Document Verification)
3 days
ACE (Inspection)
Reject the Application
4 days
CE (Inspection)
4 days
EIC (Inspection)
Return within 5 days
4 days
Chairman (Approval of Demand Note)
4 days
Consumer makes Online Payment
AEE (E-Verification of Payment)
Payment Confirmation to the consumer and inform to upload road cutting endorsement and select licensed plumber
DRAFTMAN
Enters meter make and number in OWC. System generates work order specifying date of installation of meter
Water Inspector
Along with plumber fixes meter at premises and uploads authorized work completion certificate, enters meter installation date in OWC
RR No & 1st Bill Generation
AUTO-CLOSE

1. Once the application is accessible under the AEE's login, they the concerned AE/JE for premises inspection and document verification. (Note: this has to happen within 4 days from the date of receiving the application)
2. The concerned AE/JE (within 7 days) must complete their tasks within the stipulated time, prepare the inspection report, and forward it to the AEE for review.
3. The AEE then forwards the same to TO for Document Verification. (Note: To be done within 4 days)
4. If the TO is satisfied, they will forward the application to the EE for inspection. (Note: To be done within 3 days)
5. Once done with the inspection the EE will forward the application to the TA for Document Verification at his/her level. (Note: To be done within 4 days)
6. The TA carries out the Document verification and further forwards the same to the ACE for Inspection. (Note: To be done within 3 days)
7. Once done with the inspection the ACE will forward the application to CE for inspection. (Note: To be done within 4 days).
8. Similarly the CE after completing the inspection at his/her level will forward the same to the EIC for inspection at his/her level. (Note: To be done within 4 days)
9. Once the inspection is done at the EIC level the application is then forwarded to the Chairman level for approval.(Note: To be done within 4 days)
10. If the Chairman is not satisfied then he/she will send the application back to the CE for re-evaluation and submission of an updated report. (Note: To be done within 5 days)
11. The Chairman if satisfied will approve the application and generate a demand note and share the same with the consumer for online payment.(Note: To be done within 4 days)
12. Once the payment by the consumer is successful the AEE verifies the E-receipt, forwards it to the Draftsman and shares the same with the consumer informing them to upload the road cutting endorsement and select a licensed plumber.
13. The Draftsman then enters the meter make and number in the OWC system, which generates a work order specifying the date of installation for the meter. The Draftsman then forwards the same to the Water Inspector.
14. The Water Inspector, along with the Plumber, installs the meter at the premises, uploads the authorized Work Completion Certificate, and records the meter installation date in the OWC system.
15. After this, the RR number following the first bill are generated in the Sajala Billing Software.

3.5. Role Master

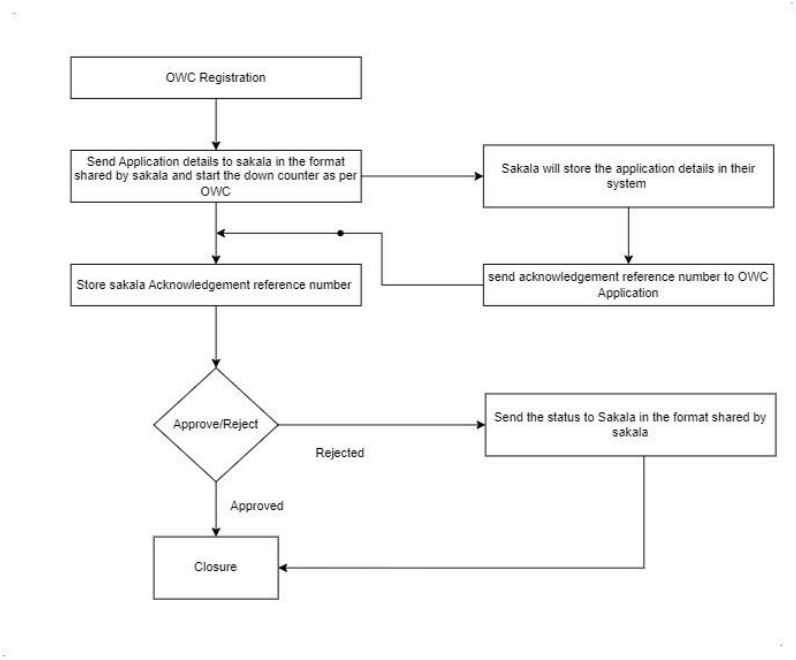
Role	Responsibility
AEE	The AEE is responsible for managing applications where the water supply connection is half an inch in diameter, for domestic connections with a built-up area of up to 700 square meters, and for non-domestic connections with a built-up area of up to 500 square meters. In cases where domestic and non-domestic connections are combined, the total built-up area should not exceed 700 square meters. If the commercial portion in such a combined utility exceeds 500 square meters, the application will be forwarded to a higher authority.

EE	The EE is authorized to handle applications where the water supply connection is three-fourths of an inch in diameter, for domestic connections with a built-up area ranging from 701 to 2,000 square meters, and for non-domestic connections with a built-up area ranging from 501 to 1,000 square meters. In cases where domestic and non-domestic connections are combined, the total built-up area should range from 701 to 2,000 square meters. If the commercial portion in such a combined utility exceeds 1,000 square meters, the application will be escalated to a higher authority.
ACE	The role is responsible for overseeing applications where the water supply connection is one inch in diameter, for domestic connections with a built-up area ranging from 2,001 to 5,000 square meters, and for non-domestic connections with a built-up area between 1,001 and 3,000 square meters. In cases where domestic and non-domestic connections are combined, the total built-up area should range from 2,001 to 10,000 square meters.
CE(M)	The CE(M) is authorized to handle applications where the water supply connection is 1 1/2 inches in diameter. This includes domestic connections with a built-up area ranging from 5,001 to 20,000 square meters, non-domestic connections with a built-up area between 3,001 and 20,000 square meters, and combined domestic and non-domestic connections with a total built-up area ranging from 10,001 to 20,000 square meters.
EIC -1	The EIC is responsible for handling applications where the water supply connection is 2 inches in diameter. This includes domestic connections with a built-up area ranging from 20,001 to 30,000 square meters, non-domestic connections within the same area range, and combined domestic and non-domestic connections with a total built-up area from 20,001 to 30,000 square meters.
EIC - 2	The EIC is authorized to handle applications where the water supply connection is 3 inches in diameter. This includes domestic connections with a built-up area ranging from 30,001 to 50,000 square meters, non-domestic connections with a built-up area between 30,001 and 35,000 square meters, and combined domestic and non-domestic connections with a total built-up area from 30,001 to 50,000 square meters.
Chairman	The Chairman is authorized to handle applications where the water supply connection is 4 inches & above in diameter. This includes domestic connections with a built-up area of 50,001 square meters and above, non-domestic connections with a built-up area of 35,001 square meters and above, and combined domestic and non-domestic connections with a total built-up area of 50,001 square meters and above.

Consumer	Consumers must provide accurate personal and property details during the application to ensure proper processing and approval. They are responsible for submitting all necessary documentation, such as proof of identity and property ownership, and making the applicable payments for water supply connections and related services as outlined in the Demand Note. Additionally, consumers are required to select a licensed plumber for the installation of the water connection and ensure compliance with all regulations and requirements set forth by the BWSSB, including any agreements with the licensed plumber. They must also cooperate with site inspections conducted by BWSSB officials to verify compliance and suitability for service. Lastly, consumers can follow up on their applications to check the status and address any queries or issues that may arise during processing.
Admin	The admin typically oversees user account management by creating, modifying, and deleting user accounts while assigning appropriate roles and permissions. They also generate reports and analytics to assess operational efficiency and identify areas for improvement. Furthermore, the admin is involved in content management, such as updating guidelines, forms, and procedures to ensure users have access to the latest information.
Water Inspector	The role of the Water Inspector is pivotal in ensuring the accuracy and integrity of the water connection process. Upon receiving a water connection application, the Water Inspector is responsible for physically visiting the consumer's address to verify the details provided during the application process, such as the identity of the applicant, the legitimacy of the property, and adherence to regulatory requirements. Furthermore, after the plumber completes the installation of the water connection, the Water Inspector conducts a follow-up visit to the consumer's location to assess the quality of the work done.
Plumber	Once a consumer's application for a water connection has been approved and the demand note payment is completed, the plumber is assigned to carry out the physical installation at the consumer's premises. After completing the installation, the plumber is required to document the work performed and take completion photos to provide evidence of the job done.
Technical Assistant/ Officer	The Technical Assistant/ officer provides support to engineers and inspectors by helping them with technical queries related to water supply systems, ensuring they have the necessary information to perform their duties effectively.
Draftsmen	The role of the draftsman is to raise the demand note based on the feedback provided by the engineer, and this demand note serves as a crucial document for the consumer to pay the water connection fees.

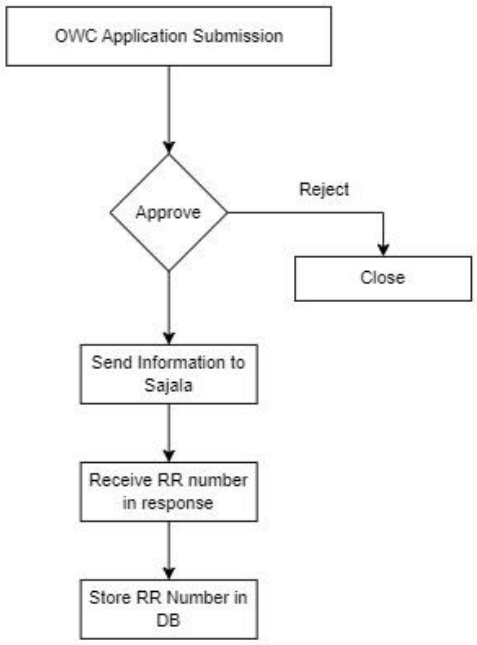
3.6. Integrations Done

3.6.1. Sakala


OWC Registration
Send Application details to sakala in the format shared by sakala and start the down counter as per OWC
Sakala will store the application details in their system
Store sakala Acknowledgement reference number
send acknowledgement reference number to OWC Application
Approve/Reject
Rejected
Send the status to Sakala in the format shared by sakala
Approved
Closure

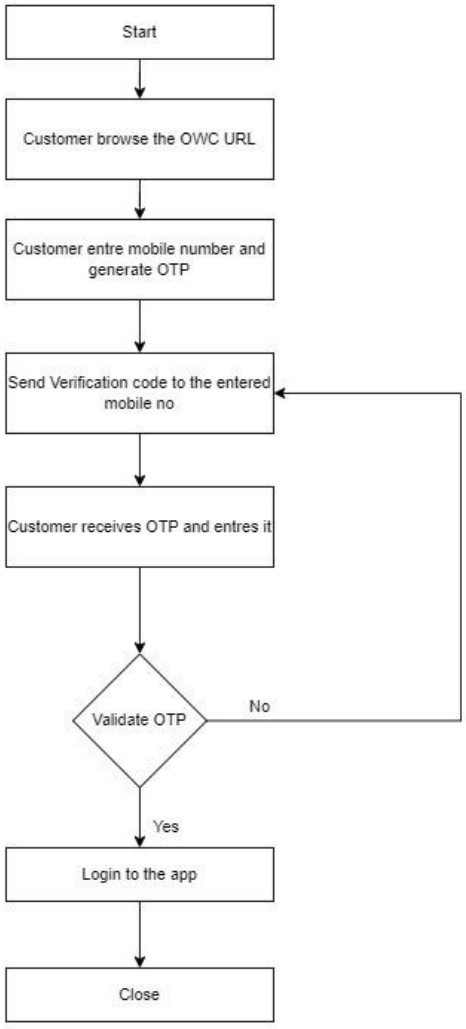
1. After the OWC application is registered, the application details are sent to "Sakala" in a specific format shared by Sakala.
2. A timer starts for processing the OWC application as per its defined timeline.
3. The Sakala system receives and stores the OWC application details in their system.
4. Sakala generates and sends an acknowledgment reference number back to the OWC application to confirm receipt.
5. The acknowledgment reference number received from Sakala is stored in the OWC application system.
6. The OWC application is then processed, and a decision is made whether to approve or reject it.
7. If the application is rejected, the status is sent back to Sakala in the predefined format. The process ends here with a closure of the rejected application.
8. If the application is approved, the status is similarly sent to Sakala in the required format. Upon approval, the OWC application is marked as closed, completing the process.

3.6.2. Sajala



1. This is the initial step where a user submits an application for an online water connection.
2. Once the application is submitted, the relevant authority must review it and decide whether to approve or reject it.
    a. If approved, the process continues.
    b. If rejected, the application is closed, and the process ends.
3. After approval, the system sends the relevant information to a system or module called "Sajala." This is likely another system integrated into the process for managing water connections or facilitating further actions.
4. Upon receiving the information, the Sajala system responds by generating an RR (Revenue Register) number, a unique identifier for the water connection.
5. The system then stores this RR number in the database for future reference and record-keeping.

3.6.3. SMS



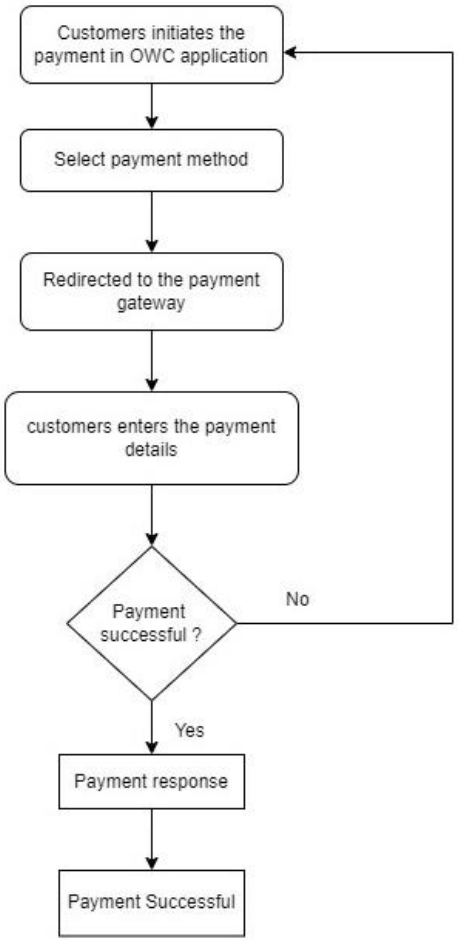
1. The customer opens the web application by navigating to a specific URL for the service (likely OWC stands for some application related to online services).
2. The customer is prompted to enter their mobile phone number into the application to generate an OTP.
3. After the customer submits their mobile number, the system sends an OTP (verification code) to the mobile number via SMS or another communication method.
4. The customer receives the OTP on their mobile device and inputs it into the application.
5. The system checks the OTP provided by the customer to see if it matches the one that was sent:
6. Once the OTP is validated successfully, the customer is logged into the application.

3.6.4. Ease of doing business (EODB)

The **Ease of Doing Business (EODB)**initiative aims to simplify regulatory processes, reduce bureaucratic hurdles, and make it easier for businesses and individuals to access government services. In India, both the central and state governments have been actively working to improve EODB by digitizing services, streamlining procedures, and enhancing transparency. This initiative is crucial for fostering economic growth and improving public service delivery.

3.6.5. Payment Gateway

The Jaladhare application is integrated with PayU and Kotak Bank as payment gateways, allowing users to make secure online payments for their water connection applications. This integration facilitates a seamless payment experience, ensuring that transactions are processed efficiently and securely within the application.



1. The process begins when the customer decides to make a payment and initiates the payment process within the OWC application.
2. The customer selects their preferred payment method (such as credit card, debit card, net banking, UPI, etc.) from the available options provided by the OWC application.
3. After selecting the payment method, the customer is redirected to the external payment gateway platform to complete the transaction.
4. On the payment gateway page, the customer is required to enter the necessary payment details (e.g., card number, CVV, expiration date, or bank credentials).
5. This decision point checks whether the payment was successful or not.
6. If the payment is not successful (e.g., due to insufficient funds, incorrect details, or other errors), the process loops back to allow the customer to retry or take some other action.
7. If the payment is successful, the process continues to the next steps.
8. The payment gateway sends a response back to the OWC application confirming whether the payment was successful or failed.

9. If the payment is confirmed as successful, the OWC application records the payment and may display a confirmation message or receipt to the customer.

3.7. SMS Triggers and Template

Trigger	Template
OTP	Welcome to BWSSB. Your OTP For login is {#var}. Please do not share with others. -BWSSBC
New Application Payment	Dear Consumer,{#var} is your BWSSB Application Payment transaction number made on date {#var} {#var}. Kindly use this transaction ID to verify the payment status. Do not share it with anyone.-BWSSB
Demand Note Payment	Dear Consumer, {#var} is your BWSSB Demand Note Payment transaction number made on date {#var} {#var}, kindly use this reference ID to verify the payment status. Do not share it with anyone.-BWSSB
For Revised Demand note	Application no. {#var} revised demand note is approved, please log onto owc.bwssb.gov.in for revised payment details.-BWSSB
Tentative Transaction	Dear Consumer, {#var} is your BWSSB Tentative transaction number made on date {#var} {#var}, kindly use this reference ID to verify the payment status. Do not share it with anyone.-BWSSB
New Application Submission	Welcome to BWSSB. Your application No. {#var} has sent for verification. -BWSSBC
Application pending	Application no. {#var} is pending, please log onto owc.bwssb.gov.in for reasons & resubmit within 3 days otherwise your application will be rejected. -BWSSBC
Application approved	Application no. {#var} is approved, please log onto owc.bwssb.gov.in for payment details.-BWSSB
Sakala Scheduler alert	As of {#var}, Sakala Auto update has stopped. Kindly switch it ON manually via Adminer. From BWSSB

4. Technology

The technology used to develop the OWC application in 2015 is mentioned below.

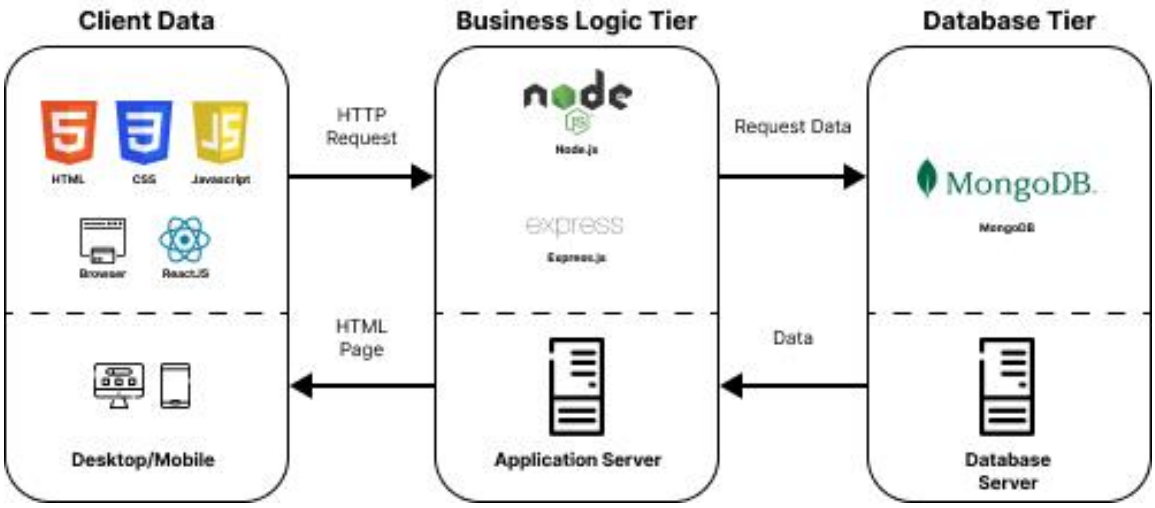
PHPVersion: 5.4.45

CodeignitorVersion: 3.0

MySQLVersion: 5.1.73

5. Proposed Jaladhare Revamp

5.1. Redesigning Jaladhare using MERN Stack (Option1)



MERN Architecture

Client-Side (React):

1. Users interact with the application through a dynamic UI built with React.
2. React components manage the user interface, making it responsive and engaging.
3. State management libraries (like Redux) can be incorporated to handle application state more effectively.

Server-Side (Node.js and Express.js):

1. The Express.js server handles incoming requests from the client.
2. It processes these requests, communicates with the MongoDB database, and sends responses back to the client.
3. Middleware functions can be used for handling authentication, logging, and data validation.

Database (MongoDB):

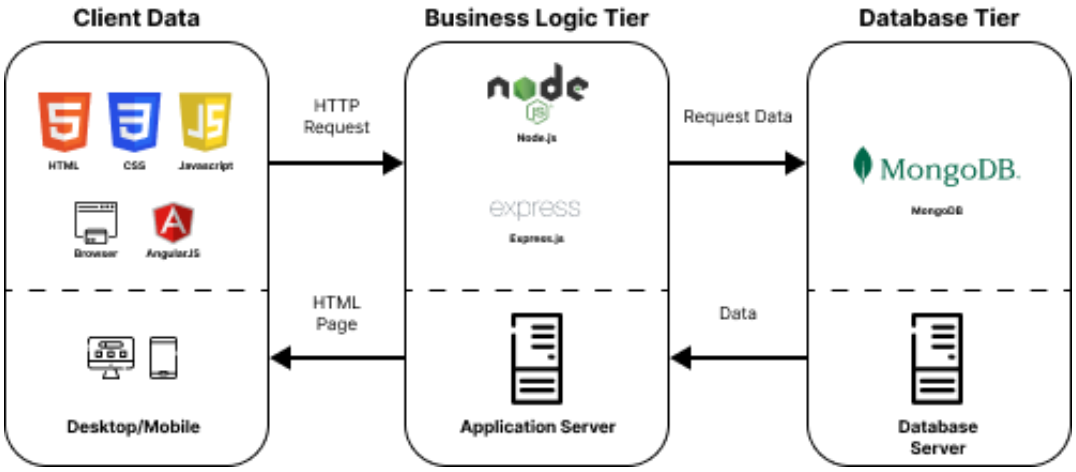
1. MongoDB stores all application data, including user information, application statuses, and payment records.
2. Its flexible schema allows for easy updates and scaling as the application grows.

React Native (Mobile)

The mobile application for the Jaladhare project will be developed using React Native, a popular framework for building cross-platform mobile applications. React Native allows developers to create applications for both iOS and Android using a single codebase, significantly reducing development time and effort. This framework leverages the power of React, enabling the use of reusable components and providing a smooth user experience that closely resembles native applications. By utilizing React Native, the Jaladhare mobile application can deliver high performance, responsive design, and access to native device

features, ensuring that users have a seamless and efficient experience when interacting with the application for tasks such as scheduling plumber appointments, tracking application statuses, and uploading documents.

5.2. Redesigning Jaladhare using MEAN Stack (Option2)



Client-Side (Angular):

1. Component-based architecture, promoting code reusability and maintainability.
2. Two-way data binding, allowing automatic synchronization between the model and the view..

Server-Side (Node.js and Express.js):

3. The Express.js server handles incoming requests from the client.
4. It processes these requests, communicates with the MongoDB database, and sends responses back to the client.
5. Middleware functions can be used for handling authentication, logging, and data validation.

Database (MongoDB):

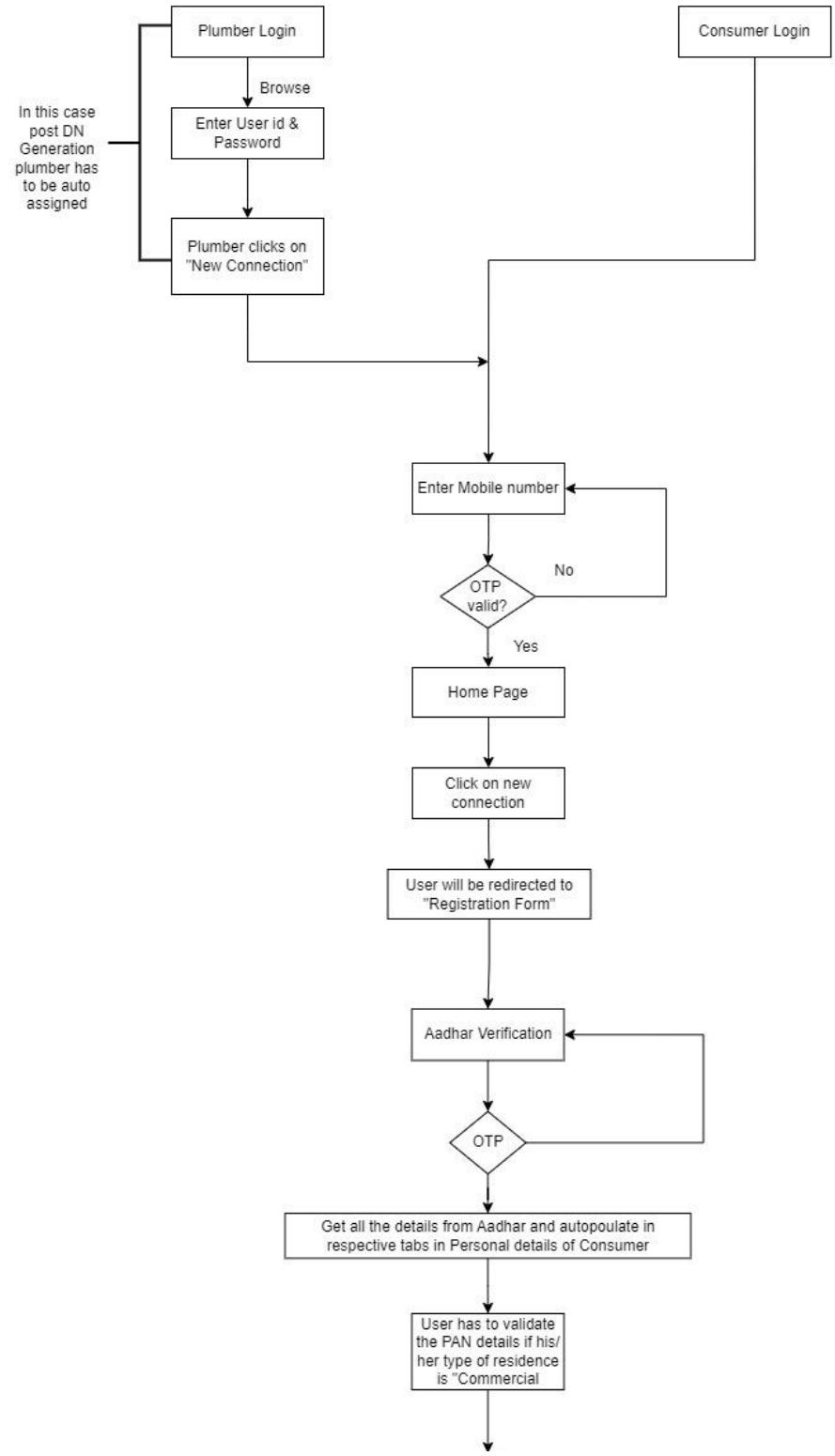
1. MongoDB stores all application data, including user information, application statuses, and payment records.
2. Its flexible schema allows for easy updates and scaling as the application grows.

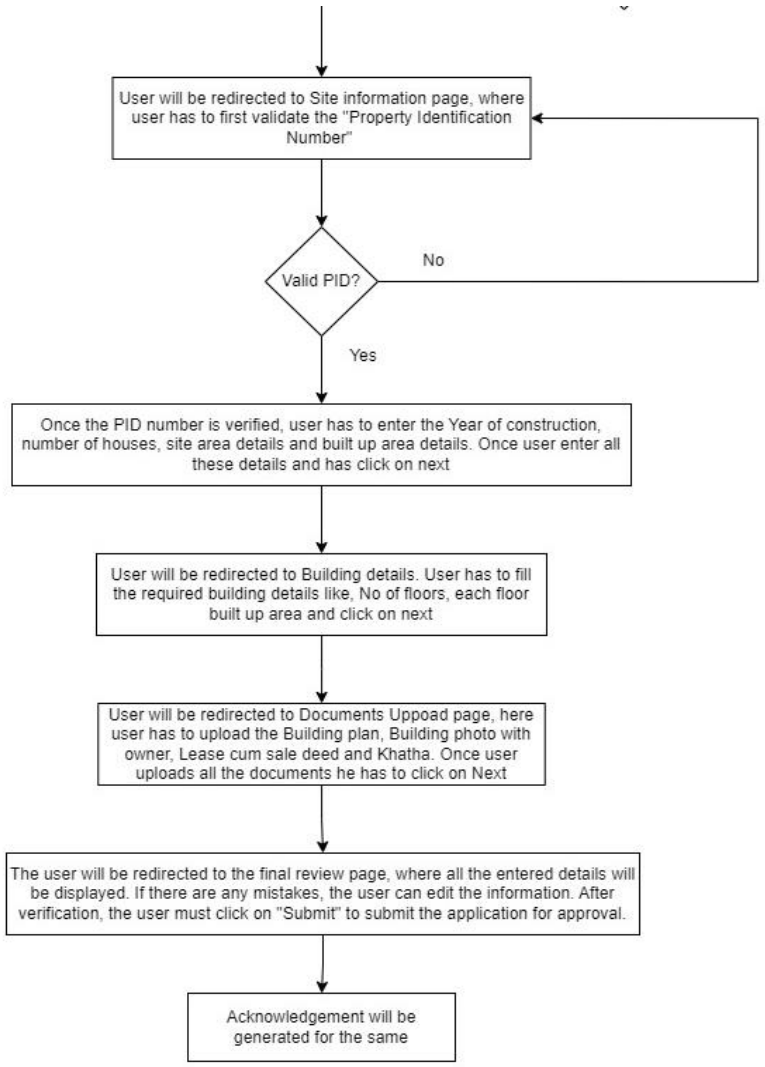
5.3. Database

MySQL(Option1):

PostgreSQL(Option2):

5.4. Proposed Consumer Flow

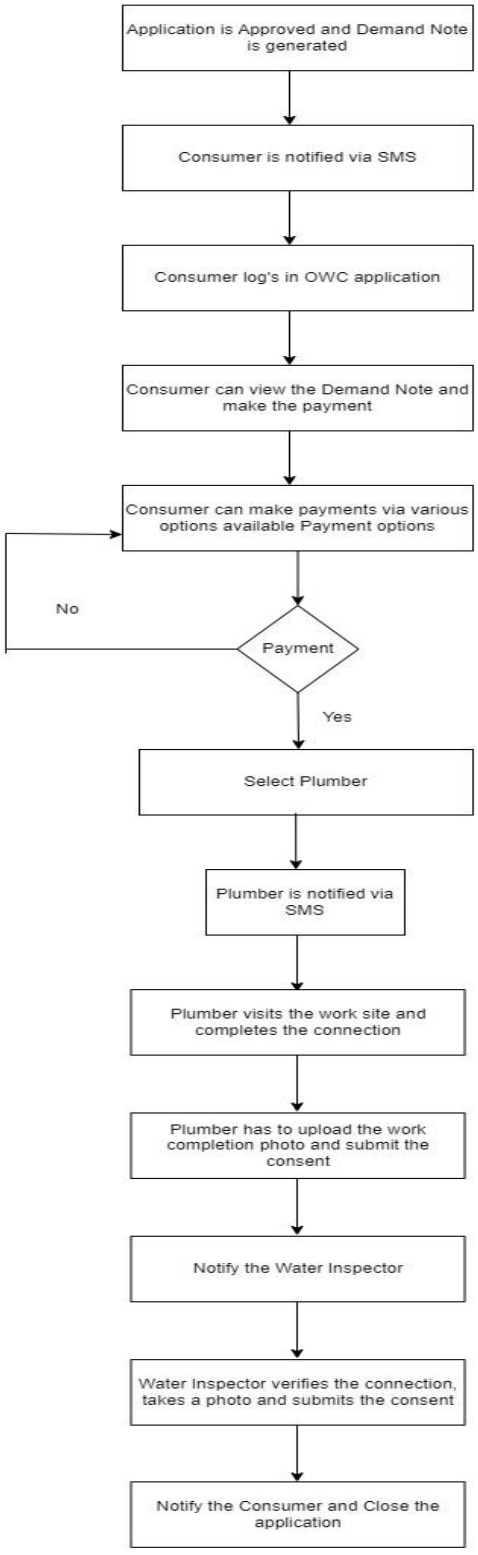

Plumber Login
Consumer Login
Browse
In this case post DN Generation plumber has to be auto assigned
Enter User id & Password
Plumber clicks on "New Connection"
Enter Mobile number
OTP valid?
No
Yes
Home Page
Click on new connection
User will be redirected to "Registration Form"
Aadhar Verification
OTP
Get all the details from Aadhar and autopoulate in respective tabs in Personal details of Consumer
User has to validate the PAN details if his/ her type of residence is "Commercial


User will be redirected to Site information page, where user has to first validate the "Property Identification Number"
Valid PID?
No
Yes
Once the PID number is verified, user has to enter the Year of construction, number of houses, site area details and built up area details. Once user enter all these details and has click on next
User will be redirected to Building details. User has to fill the required building details like, No of floors, each floor built up area and click on next
User will be redirected to Documents Uppoad page, here user has to upload the Building plan, Building photo with owner, Lease cum sale deed and Khatha. Once user uploads all the documents he has to click on Next
The user will be redirected to the final review page, where all the entered details will be displayed. If there are any mistakes, the user can edit the information. After verification, the user must click on "Submit" to submit the application for approval.
Acknowledgement will be generated for the same

1. To apply for a water connection, the application can be submitted either through the Plumber login or directly by the consumer.
2. The process remains consistent; however, if the application is submitted through a plumber's login, the plumber who submitted it will automatically be assigned as the designated plumber after the demand note is generated.
3. Upon selecting "New Connection," the user is redirected to the Water Connection Application form.
4. Note that the initial payment of Rs. 100, currently required at the time of registration in the Jaladhare app, will be included in the demand note, and the separate initial payment step will be eliminated.
5. The application process begins with mobile number validation, where the user enters their mobile number and generates an OTP.
6. The OTP is sent to the provided mobile number, and upon entering and successfully validating it, the user is redirected to the application form.
7. The next step is Aadhaar number verification. The user enters their Aadhaar number and clicks "Verify," which redirects them to the eGov Aadhaar verification page.
8. Here, the user must enter the OTP sent to the mobile number linked to their Aadhaar. Upon successful verification, Aadhaar details are automatically populated into the relevant fields.

9. For commercial properties, PAN validation is required. The user must enter the consumer's PAN number and click "Validate." If the PAN is successfully validated, a success message stating "PAN Validated" will be displayed.
10. Following Aadhaar and PAN validation, the user enters their communication address and clicks "Next" to save the consumer details.
11. The user is then redirected to the site information page, where they must validate the "Property Identification Number" (PIN).
12. Upon successful verification, a "PIN Validation Successful" message is displayed, allowing the user to continue the application process.
13. The user then enters details such as the year of construction, the number of houses, site area details, and built-up area details, before clicking "Next."
14. The user is subsequently redirected to the building details page to provide information like the number of floors and the built-up area for each floor, followed by another "Next" click.
15. Next, the user is directed to the document upload page, where they upload required documents, including the building plan, a photo of the building with the owner, the lease cum sale deed, and the Khatha (property document). After uploading the documents, the user clicks "Next."
16. The final step is the review page, where all entered details are displayed. The user can edit any information if necessary.
17. Once everything is verified, the user clicks on "Submit" to submit the application for approval.
18. An acknowledgment is then generated, confirming the successful submission of the application.

5.5. Proposed Consumer Flow Post Demand Note Generation


Application is Approved and Demand Note is generated
Consumer is notified via SMS
Consumer log's in OWC application
Consumer can view the Demand Note and make the payment
Consumer can make payments via various options available Payment options
No
Payment
Yes
Select Plumber
Plumber is notified via SMS
Plumber visits the work site and completes the connection
Plumber has to upload the work completion photo and submit the consent
Notify the Water Inspector
Water Inspector verifies the connection, takes a photo and submits the consent
Notify the Consumer and Close the application

1. Once the application is approved by the concerned officer. A demand note would be generated which estimates the total amount payable by the consumer.
2. The consumer is notified via SMS that the demand note has been generated.

3. The consumer logs into the OWC (Online Water Connection) application. The consumer can view the demand note within the application and proceed to make the payment.
4. The consumer can make payments using various available payment options. If payment is not made, the process stops here. If payment is made, the process continues to the next step.
5. After successful payment, the consumer selects a plumber. The selected plumber is notified via SMS.
6. The plumber visits the work site and completes the water connection. The plumber uploads a photo of the completed work and submits their consent.
7. The water inspector is notified to inspect the connection. The water inspector verifies the connection, takes a photo, and submits their consent.
8. The consumer is notified that the process is complete, and the application is closed.

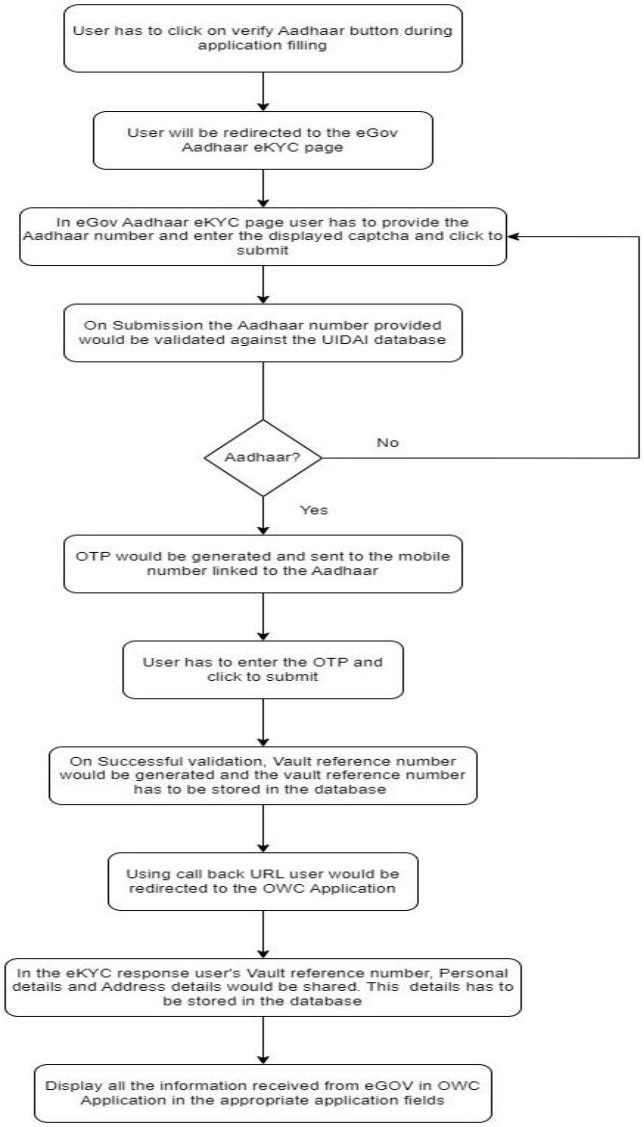
6. Database Design

Refer the existing Jaladhare version 2.0 database

7. Proposed Features

7.1. Aadhaar Integration

Integrating the Jaladhare application with the eGOV platform for Aadhaar verification aims to enhance the security and reliability of user identity validation during the water connection application process. This integration will involve modifying the registration workflow to include an Aadhaar number input field, where users will provide their Aadhaar details along with consent for verification. Upon submission, the application will trigger a request to the eGOVAadhaar verification API, which will check the validity of the Aadhaar number and ensure it matches the user's details.


User has to click on verify Aadhaar button during application filling
User will be redirected to the eGov Aadhaar eKYC page
In eGov Aadhaar eKYC page user has to provide the Aadhaar number and enter the displayed captcha and click to submit
On Submission the Aadhaar number provided would be validated against the UIDAI database
Aadhaar?
No
Yes
OTP would be generated and sent to the mobile number linked to the Aadhaar
User has to enter the OTP and click to submit
On Successful validation, Vault reference number would be generated and the vault reference number has to be stored in the database
Using call back URL user would be redirected to the OWC Application
In the eKYC response user's Vault reference number, Personal details and Address details would be shared. This details has to be stored in the database
Display all the information received from eGOV in OWC Application in the appropriate application fields

7.2. PAN Integration for Commercial Sites

Integrating PAN (Permanent Account Number) verification into the Jaladhare application for commercial sites is essential for ensuring the authenticity of business entities applying for water connections.

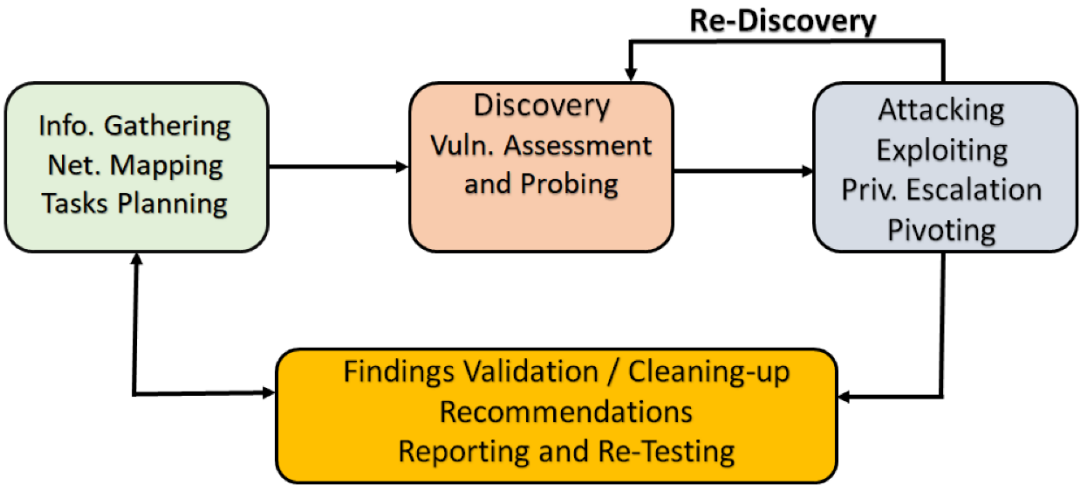
7.3. Mobile Application for Engineer and Plumber

The mobile application for engineers and plumbers in the Jaladhare system has to be designed to enhance the efficiency and accuracy of the water connection process. Site engineers will use the app to verify applicant details on-site, allowing them to assess the eligibility and requirements of the water connection application. During the site inspection, engineers can approve or reject applications based on their findings, ensuring that only qualified applicants receive service. This real-time validation and decision-making capability streamline the approval process, reducing delays and improving service delivery.

For plumbers, the mobile application provides a vital tool to document their work upon completing the installation. After finishing the water connection, plumbers can take a completion photo using the app, which serves as proof of installation. This photo can then be uploaded directly to the system, updating the application's status and providing visual documentation of the completed work. This feature not only enhances accountability but also facilitates better communication between plumbers and the administrative team, ensuring that all steps in the installation process are recorded and verified promptly. Overall, the mobile application will significantly improve operational efficiency and transparency in the water connection service.

7.4. VAPT

In Jaladhare application, Vulnerability Assessment and Penetration Testing (VAPT) are crucial components of the security strategy aimed at safeguarding user data and ensuring the integrity of the system. Vulnerability assessment involves systematically identifying, quantifying, and prioritizing security flaws within the application and its infrastructure. This proactive approach helps in understanding and managing potential risks, ensuring that vulnerabilities in networks, applications, and databases are identified and addressed before they can be exploited by malicious actors.



On the other hand, penetration testing takes a more hands-on approach by simulating real-world cyber-attacks to actively exploit identified vulnerabilities. This method evaluates the effectiveness of existing security measures and provides actionable insights for improving the overall security posture of the Jaladhare application. By mimicking actual attack scenarios, penetration testing helps validate defenses and identify areas for enhancement. Together, vulnerability assessment and penetration testing form a comprehensive strategy that not only focuses on risk management and prevention but also tests the resilience of the application against potential threats, ultimately ensuring the security and reliability of the Jaladhare application for its users.

7.5. Analytics

Integrating Power BI analytics into the Jaladhare application can yield a variety of insights that can significantly enhance decision-making and operational efficiency. Here are several types of analytics that has to be derived:

1. **Application Status Analytics**
2. **Demographic Analysis**
3. **Performance Metrics**
4. **Payment Analytics**
5. **Predictive Analytics**
6. **Reporting and Compliance**

7.6. Workflow Management

7.7. Chatbot

7.8. Estimate Calculator

The proposed Jaladhare application will feature a calculator on the login page designed to help potential consumers estimate the costs associated with obtaining a water connection before they formally apply.

7.9. Property Identification Number (PID) Validation

In the proposed Jaladhare application, integration with the Property Identification Number (PID) API provided by BBMP has to be implemented to validate the ID numbers entered by users during the application process.

7.10. OWC Application V1 and V2 Reports

In the proposed Jaladhare application V3, reports from the previous versions, V1 and V2, has be generated and made accessible to all officers. This accessibility to historical data is crucial, as it ensures that all relevant information is readily available for any future use, allowing for better decision-making, analysis, and continuity in operations.

7.11. Additional Payment Gateway Integration

7.12. Plumber Management

In the proposed Jaladhare application, the plumber management feature will streamline the processes of registration and renewal by allowing plumbers to complete these tasks directly within the application.

7.13. RR Number Validation

In the Jaladhare application, the RR (Register Receipt) Number validation will be conducted through integration with the Sajala API, which serves as a reliable external reference for verifying the authenticity and status of RR numbers.

7.14. Geo Tagging

The geo-tagging feature in the proposed Jaladhare application will enable site inspection engineers to enhance the accuracy and accountability of field inspections.

7.15. Online Payment Reconciliation

The online payment reconciliation feature in the proposed Jaladhare application will streamline the process of matching and verifying payment transactions made by users against the records in the system.

7.16. Log Management

Log management will serve as a critical feature for tracking and auditing all changes made within the system. Every action taken by users, whether it involves updating application details, processing payments, or modifying workflows, will be meticulously logged. Each log entry will include essential information such as the specific change made, the user ID of the individual performing the action, and the IP address from which the action was initiated.

7.17. Esign and Digilocker Integration

7.18. Seva Sindhu Integration

In the future, the Jaladhare application will be integrated with the Seva Sindhu platform, allowing for a more seamless user experience by featuring two distinct frontends: the Jaladhare application itself and applications submitted through Seva Sindhu.

8. Functional Requirements

The following are the functional requirements of the new Jaladhare application

ID	Requirement
FR1	Users must be able to register for a new account using their mobile number and email.
FR2	Users must receive an SMS verification code to validate their mobile number during registration.
FR3	Users must be able to log in using their registered Mobile Number.
FR4	User must fill out the online water application form, providing:
FR4.1	Personal details (name, address, etc.)
FR4.2	Site details (location, type of connection)
FR4.3	Building details (type of building, number of floors)
FR4.4	Upload necessary documents (identity proof, property documents).
FR5	After completing the form, consumers must submit the application for approval.
FR6	Upon receiving the application, the concerned area site inspection official must visit the site to validate the information and update in the application
FR7	The site inspection official must forward the application to the concerned approving authority for further processing.
FR8	Once approved, the system must generate a demand note that includes the pricing of the water connection.
FR9	The approving authority varie based on sital area. The detailed approving authority and conditions are mentioned under section 3.5

FR10	Consumers must pay the demand amount indicated in the demand note
FR11	Consumers must have the option to select a desired plumber after making the payment.
FR12	Once the plumber is assigned, the plumber must visit the consumer's location to complete the water connection installation.
FR13	After completing the installation, the plumber must upload the work completion certificate through the application.
FR14	The application must be closed after the plumber uploads the work completion certificate.
FR15	The system should update the application status to "Completed" and notify the consumer.
FR16	Users must be able to make payments through integrated payment gateways (PayU, Kotak Bank, and an additional payment gateway).
FR17	The system must securely process payments and generate a receipt for successful transactions.
FR18	An online payment reconciliation feature must match and verify payment transactions against internal records.
FR19	Users must be able to track the status of their applications in real time.
FR20	The application status should be updated automatically based on actions taken by the admin.
FR21	Admin users must have access to a dashboard for managing applications.
FR22	Admins must be able to view, approve, or reject applications.
FR23	Admins must be able to assign plumbers automatically upon application approval.

FR24	The system must allow BWSSB officials to manage and alter workflows as needed.
FR25	Workflow changes should be implemented without requiring extensive technical support.
FR26	The application must include a chatbot to assist users with basic inquiries and tasks related to the water connection process.
FR27	The chatbot should provide 24/7 support and handle FAQs effectively.
FR28	The system must allow plumbers to register and renew their credentials directly within the application.
FR29	Necessary criteria and documentation for registration and renewal must be included in the application.
FR30	BWSSB must be able to generate reports on active plumbers, categorized by area.
FR31	Site inspection engineers must be able to capture GPS coordinates during field inspections.
FR32	Engineers must be able to take and submit photos of the site along with the GPS data.
FR33	The application must integrate with eSign to allow users to electronically sign documents.
FR34	Users must be able to store and access important documents securely through DigiLocker.
FR35	The application must validate RR numbers against the Sajala API to ensure their authenticity.
FR36	The system must integrate with the Seva Sindhu platform, allowing for two frontends: Jaladhare and Seva Sindhu applications.
FR37	The application must maintain a record of application origins to identify where each application originated.

FR38	The system must log every change made, including user ID and IP address for accountability and audit purposes.
FR39	Application must be integrated with Sakala
FR40	Application must be integrated with Sajala
FR41	Application must be feasible to integrate with multiple payment gateway providers
FR42	Application must be integrated with SMS service provider for Mobile number validation
FR43	Application must be integrated with eGov for Aadhaar verification
FR44	A calculator feature must be available on the login page to estimate water connection fees based on site area and the number of floors.
FR45	Historical reports from Jaladhare applications V1 and V2 must be generated and accessible to all officers for future reference.
FR46	The system must log every user action, including user ID, IP address, and timestamp, for accountability and audit purposes.
FR47	The application must integrate with the PID API to validate property details.
FR48	The application must integrate with the PAN API to validate PAN card.
FR49	Admin users must access a dashboard to manage applications and user accounts.
FR50	Admins must assign plumbers to approved applications
FR51	The system must integrate with the eGOVAadhaar verification API to validate Aadhaar numbers provided by users.
FR52	Users must provide consent for their Aadhaar information to be processed.
FR53	Upon successful verification, the system should update the user’s application status to

	"Verified."
FR54	If verification fails, the user must receive a notification indicating the issue.
FR55	The application must allow users applying for commercial connections to enter their PAN details.
FR56	The system should validate the entered PAN against the relevant tax authority's API.
FR57	Upon successful validation, the application status should reflect "PAN Verified."
FR58	If validation fails, appropriate error messages should be displayed to the user.
FR59	The mobile application must allow site engineers to verify applicant details during inspections.
FR60	Engineers should be able to capture GPS coordinates and upload photos of the site.
FR61	Plumbers must be able to upload completion certificates after finishing the installation. Both roles should receive notifications about application statuses.
FR62	The system must undergo regular (6 months once) vulnerability assessments and penetration testing to identify security flaws.
FR63	Results from VAPT must be documented and used to enhance the security posture of the application.
FR64	Security reports should be accessible to administrators for compliance and monitoring.
FR65	The system must integrate Power BI for real-time data visualization and reporting.
FR66	Users should have access to reports on application status, user demographics, and performance metrics.
FR67	The application must allow for filtering and drilling down into specific data sets for detailed analysis.

FR68	Administrators must be able to define, manage, and alter workflows within the application.
FR69	Changes to workflows should be implemented without needing development support.
FR70	The system must maintain an audit trail of workflow changes.
FR71	The application must include a chatbot to assist consumers with basic inquiries.
FR72	The chatbot should provide 24/7 support for FAQs related to water connections. The chatbot must escalate complex queries to human support when necessary.
FR73	Consumers must be able to schedule appointments with plumbers for installation. The system should allow users to select available time slots.
FR74	Notifications should be sent to both consumers and plumbers upon scheduling confirmation.
FR75	A calculator feature must be available on the login page for consumers to estimate water connection fees.
FR76	The calculator should take into account site area and number of floors to provide estimates.
FR77	The application must integrate with the PID API provided by BBMP to validate property details.
FR78	Upon submission of the PID, the system should verify its authenticity and update the application status accordingly. Users must receive notifications about the validation result.
FR79	The system must generate reports from Jaladhare applications V1 and V2 for administrative use.
FR80	Reports should be accessible to all officers for analysis and monitoring purposes.
FR81	Historical data should be maintained for future reference.

FR82	The application must support integration with an additional payment gateway beyond PayU and Kotak Bank.
FR83	Users should be able to select their preferred payment gateway during the payment process.
FR84	The system must ensure secure processing of transactions through all integrated gateways.
FR85	The application must allow plumbers to register and renew their credentials.
FR86	Admins should be able to view and manage plumber profiles and statuses.
FR87	Reports on active plumbers should be generated and accessible to administrators.
FR88	The application must validate RR numbers against the Sajala API to ensure authenticity.
FR89	Users must receive notifications regarding the validation status of their RR numbers.
FR90	The application must support geo-tagging for site inspections.
FR91	Site inspection officials must capture GPS coordinates during visits and upload them to the system.
FR92	Photos taken during inspections should be linked to the corresponding application records.
FR93	The system must automatically reconcile payments processed through integrated gateways.
FR94	Transaction details should be logged for audit purposes.
FR95	Discrepancies in payment should trigger alerts for manual review.
FR97	The system must log every user action, including timestamps, user IDs, and IP addresses.Logs should be maintained for auditing and monitoring purposes.

FR98	The application must integrate with eSign to facilitate electronic signing of documents.
FR99	Users must be able to securely store and retrieve documents via DigiLocker.
FR100	The application must integrate with the Seva Sindhu platform to allow users to access water connection services.
FR101	The system should maintain a record of application origins to track where each application was submitted.
FR102	The system must generate a report summarizing all applications received within a specified date range.
FR103	The report must include details such as application ID, user ID, application status, date of submission, and inspection date.
FR104	Admins must be able to filter applications by status (e.g., Pending, Approved, Rejected)
FR105	The system must generate reports on user registrations and logins over a specified period.
FR106	Reports must include user details such as user ID, registration date, and last login date.
FR107	Admins must have the ability to filter reports by user roles (Consumer, Admin, Plumber).
FR108	The application must generate payment reports detailing all transactions processed within a specific timeframe.
FR109	The report must include transaction ID, user ID, payment amount, payment method, and status (Success, Failed).
FR110	Admins should be able to filter payments by status and payment gateway.
FR111	The system must generate reports on active plumbers, including details such as

	plumber ID, name, license status, and area of operation.
FR112	Admins must have the option to filter plumbers by status (Active, Inactive) and area.
FR113	The system must provide access to historical reports from Jaladhare applications V1 and V2.
FR114	Admins must be able to generate these reports with the same filtering options as current application reports.
FR115	Users must be able to customize report parameters (e.g., date range, filters) before generating reports.
FR116	The system must allow reports to be exported in multiple formats, including PDF and CSV.
FR117	Only authorized users (e.g., Admins) must have access to view and manage rep
Non Functional Requirements	
NFR1	The application must have a response time of less than 2 seconds for all user interactions, including form submissions, data retrieval, and payment processing under normal load conditions.
NFR2	The architecture must support horizontal scaling to handle an increase in user load. The system should be capable of handling at least 10,000 concurrent users without performance degradation.
NFR3	The application should be able to scale its database to accommodate growing data volumes and user interactions.
NFR4	The system must be able to process a minimum of 100 transactions per minute during peak usage times without slowing down.
NFR5	All sensitive user data (e.g., personal information, payment details) must be encrypted
NFR6	The application must implement secure authentication mechanisms

NFR7	The application must comply with relevant data protection regulations to safeguard user information.
NFR8	The application must have an intuitive user interface that allows users to navigate easily without requiring extensive training.
NFR9	The user interface should be responsive and accessible across various devices, including desktops, tablets, and mobile phones.
NFR10	Comprehensive user documentation and help guides must be provided to assist users in understanding application functionalities and features.
NFR11	The application must achieve a minimum uptime of 99.5%, ensuring that users have consistent access to the system without interruptions.
NFR12	In the event of a failure, the system must have a recovery time objective (RTO) of no more than 30 minutes, with regular backups of user data and application settings.
NFR13	The application must be designed to handle errors gracefully, providing informative error messages to users and logging errors for further analysis without crashing.

9. System Requirements

9.1. Infrastructure Specifications for Jaladhare 3.0

1. **Cloud Environment (CSP should be MeitY empanelled & servers to be located in India)**

- **Platform:** AWS / Azure / Google Cloud
- **Deployment Type:** Virtual Machines (VMs)
- **Availability Zones:** Multi-Zone Setup

2. **Compute Resource**

Application Servers:

- **Type:** EC2 Instances (AWS) / VMs (Azure) / Compute Engine (GCP)
- **CPU:** Minimum 8 vCPUs, scalable up to 32+ vCPUs
- **Memory:** Minimum 32 GB RAM (scalable based on load)

- **Auto-scaling:** Enabled for handling peak traffic
- **OS:** Linux

3. Database

Database Server:

- PostgreSQL / MySQL
- **Instance Type:** Minimum 4 vCPUs and 16 GB RAM
- **Replication:** Master-slave setup for high availability
- **Backup:** Automated daily snapshots

4. Storage Requirement

File Storage:

- S3 Buckets (AWS) / Blob Storage (Azure) for document and photo uploads
- **Retention Policy:** Archival policy for historical data

Database Storage:

- SSD-backed storage for low latency
- **Capacity:** Starting from 500 GB, scalable based on usage

5. Networking and Security

Load Balancer:

- Application Load Balancer (ALB) / Nginx for distributing traffic
- **SSL Certificates:** For secure HTTPS communication

VPC (Virtual Private Cloud):

- Private Subnets for internal services
- Public Subnets for web traffic

- **Security Groups:** To restrict access based on IP whitelisting and role-based permissions
- **WAF (Web Application Firewall):** Protection against SQL injections, XSS, and CSRF attacks
- **API Gateway:** For secure API management

6. Authentication and Monitoring Tools

Authentication:

- OAuth 2.0 / MFA (Multi-Factor Authentication)

Monitoring Tools:

- CloudWatch (AWS) / Azure Monitor / Prometheus + Grafana

- **Crash Reporting:** Firebase Crashlytics for the mobile app
- **Analytics:** Google Analytics for tracking user engagement

9.2. Environment

For the Jaladhare application, the vendor should maintain both a staging server and a production serverto ensure quality, stability, and security in both the testing and live environments. The staging server functions as a pre-production environment, replicating the setup of the production server closely but isolated from live user access. This setup enables developers and testers to thoroughly assess new features, integrations, updates, and patches, reducing the chance of unexpected issues when these changes go live. Any testing or troubleshooting can be handled on the staging server, which helps identify and resolve potential issues without impacting real-time users.

The production server, on the other hand, hosts the live application and is accessible to end users. To meet the application's demands, the production server needs to be highly secure, performant, and reliable. Regular updates from the staging server to the production server are only made after careful testing and approval, ensuring that each deployment is stable and well-tested. With this dual-server infrastructure, Jaladhare can minimize downtime and maximize user satisfaction by enabling smooth, disruption-free transitions from development to live use, ultimately enhancing application reliability and user experience.

10. Application Security

Ensuring the security of the Jaladhare 3.0 application is crucial, as it manages sensitive data like Aadhaar numbers, PAN details, payment information, and water connection statuses. To protect the system's safety, integrity, and compliance, Jaladhare 3.0 implements robust security measures across every layer of the application.

Key Security Measures

1. **Data Encryption**

- All sensitive data, both in transit and at rest, should be encrypted using advanced encryption protocols (e.g., AES-256) to prevent unauthorized access and data breaches.

2. **Authentication and Authorization:**

- Multi-Factor Authentication (MFA) ensures secure login for users.
- Role-based access control (RBAC) limits access to features and data based on user roles such as Engineers, Plumbers, and BWSSB Officials, ensuring that only authorized users can perform specific actions.

3. **Aadhaar and PAN Integration Security:**

- Secure APIs and encrypted communication channels should be used for Aadhaar and PAN validation to ensure data privacy and avoid leaks.

4. **Vulnerability Assessment and Penetration Testing (VAPT):**

- Regular VAPT exercises are conducted to identify and resolve vulnerabilities in the application, ensuring that the system remains resilient against potential cyberattacks.

5. **OWASP Compliance:**

- Jaladhare 3.0 should follow OWASP (Open Web Application Security Project) guidelines to address common web application vulnerabilities, including SQL injection, cross-site scripting (XSS), and cross-site request forgery (CSRF).

6. **API Security:**

- APIs used within Jaladhare 3.0 should be protected using API gateways with rate limiting, API keys, and OAuth 2.0 to prevent misuse and unauthorized access.

STQC Certificate

Upon project completion, it is mandatory for the vendor to procure the **STQC (Standardisation Testing and Quality Certification)** certificate. This certification must be acquired for both the **web and mobile applications** to ensure compliance with government standards and quality benchmarks. The STQC certification will validate the security, reliability, and performance of the Jaladhare 3.0 application, supporting its readiness for public deployment.

11. Migration Plan

This Migration Plan provides a structured approach to transitioning the Jaladhare application to the MERN/MEAN stack, ensuring that all aspects of the migration are considered and managed effectively.

Planning

a. **Current State Analysis**: Review the existing Jaladhare application architecture, features, and integrations.
b. **Requirements Gathering:** Identify new requirements and enhancements needed in the MERN/MEAN stack version.
c. **Stakeholder Involvement:** Engage with stakeholders to ensure all functional needs are captured.

Design Phase

a. **Architecture Design:** Create a detailed architecture plan for the MERN/MEAN stack, including database schema, API endpoints, and front-end components.
b. **User Interface Design**: Develop wireframes and prototypes for the new user interface.
c. **Web and Mobile App Designs:** Develop a user friendly web application and mobile application screens

Data Migration

a. **Data Mapping:** Identify all data entities in the existing application and map them to the new MongoDB schema
b. **Data Extraction:** Extract data from the existing MySQL database.
c. **Data Transformation:** Transform the data into the required format for MongoDB and MySQL.
d. **Data Loading:** Load the transformed data into the new database.
e. **Data Validation:** Conduct validation to ensure data integrity and consistency post-migration.

Development Phase

a. **Backend Development:** Implement server-side logic using Node.js and Express.js, including API development.
b. **Frontend Development:** Build the user interface using React, ensuring responsiveness and usability.
c. **Integration Development:** Integrate payment gateways, SMS services, and external APIs (e.g., eGOV, DigiLocker).
d. **Documentation:** Maintain comprehensive documentation of all development activities, including code explanations and other relevant materials.

Testing Phase

a. **Unit Testing:** Test individual components for functionality.
b. **Integration Testing:** Test interactions between components and systems.
c. **User Acceptance Testing (UAT):** Engage stakeholders to validate that the application meets their needs and expectations.
d. **Documentation:** Maintain comprehensive testing documentation of all testing activities.

Deployment Phase

a. **Environment Setup:** Set up production and staging environments in the cloud.
b. **Backup Existing Application:** Ensure that the current Jaladhare application is fully backed up before migration
c. **Deployment of New Application:** Deploy the new MERN/MEAN stack application to the production environment.
d. **Data Migration:** Execute the data migration process as outlined above.

Post Deployment phase

a. **Monitoring:** Monitor the application for performance issues and errors post-deployment.
b. **User Training:** Provide training for users on the new features and functionalities of the application.
c. **Support:** Establish a support mechanism to address any issues that arise during the transition.

12. VAPT Testing Process

Objectives:

1. **Identify vulnerabilities**: Conduct a comprehensive assessment of the OWC applications to identify potential security weaknesses, configuration issues, or software vulnerabilities that could be exploited.
2. **Evaluate OWC application security**: Assess the effectiveness of existing security controls, policies, and configurations implemented within the application, focusing on areas such as authentication mechanisms, access controls, encryption protocols, and network segmentation.
3. **Provide recommendations**: Deliver a detailed report outlining identified vulnerabilities, their potential impact, and prioritize remediation steps to enhance the overall security posture of the corporate network and applications.

Methodology:

RECONNAISSANCE

Conductdarkanddeepwebminingactivitiesandgatherintelligenceaboutyourorganizationa ndtheattacksurface.

ATTACKSURFACEENUMERATION

Doanenumerationoftheopenports,protocols,services,cloudpresence,operatingsystems,an dnetworkdevices.

AUTOMATEDVULNERABILITYSCANNING

Conducthigh-leveltests,accordingtoyourtimeschedules,thatlookfor potential vulnerabilities in internal and external-facing assets tounderstandinitialaccessvectors

PENETRATIONTESTING

Attemptsimulatedattackswithtactics,techniquesandprocedures(TTPs) employed by hackers. Detectvulnerabilities and misconfigurations overlooked by scanners andeliminate false positives. Goal is to bypass security controls andmovelaterallyinordertoachievedomainadministratorprivileges.

REPORTING

To share a comprehensive report along with a prioritized list of critical issues and map the vulnerabilities (CVEs) and weaknesses (CWE) to severity ratings

13. Timeline

Sl. No.	Items	Timeline (In Months)
1	Requirement gathering and mapping	T + 1 (1 month)
2	Re-development of the OWC Web application	T + 7 (6 month)
3	Development of the OWC Mobile App	T + 7 (6 month)
4	UAT and Go-Live	T + 8 (1 month)
5	VAPT service	Before Application Go-Live

**T – is the start date of the project*